DETAILED DESCRIPTION

[Detailed Description of the Invention]
The biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles Processing Biopolymers, such as DNA, RNA, mRNA, a plasmid, a virus, bacteria, or a cell, a microorganism, or matter ("it is called DNA etc." hereafter.) It is related with the art of the biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles which make it possible to work indicators, such as isolation of extraction of capture of a cell required for processing, the dissolution of a nucleus, the dissolution of protein, DNA, etc., DNA, etc., and DNA, measurement, or recovery automatically.
The background of technology Perform researches, such as DNA, recent years by all fields, such as an engineering field and a medicine field agriculture field physical-science field pharmacy field, and the genome sequencing clinical-diagnosis ****** improvement-of-a-species food bacillus inspection **** system of the purpose is various.
Thus, an application field is very large and analyses, such as DNA it is expected that the application is, are conventionally performed by the method of varieties, such as a centrifuge method, the high-speed liquid chromatography method, gel electrophoresis, the DISU poker ram method, dialysis, the glass-powder method, a magnetic-substance particle washing nozzle process, or an immune-serum reaction.
However, in the case of the above-mentioned centrifuge method, self-chambering of a container and automation of ejection were very difficult, and it was very difficult for it after centrifugal to perform fractionation of a supernatant liquid and sedimentation mechanically, and had in versatility the problem of being scarce.
Moreover, since the injection or separation time management of a sample to this column could not be mechanized since the separation column became consumables fundamentally in the case of the high-speed liquid chromatography method, and it passed through the inside of the same column, it had the problem that contamination could not be prevented completely.
furthermore, taking out the separation fragment, although in the case of gel electrophoresis adjustment of gel cannot be mechanized but separation of DNA is common as the basic technique -- business -- it had the problem that it could not but carry out by technique
On the other hand, although the DISU poker ram method is one technique kit-ized in order to take out a specific DNA fragment, its cost is very high and it is narrow. [of the use range] And it was hard to control distributive pouring and column passage liquid, and had the problem that there was a problem which should be solved in mechanization plentifully.
Moreover, since dialysis takes time and it is hard to carry out little correspondence, dialysis is seldom used.

Although the glass-powder method is an extraction method which was excellent in DNA using the matter of a silicon dioxide and the process became simple, in order for a filter or centrifugal separation to separate powder, it had the problem of being hard to turn automatically.
Furthermore, the magnetic-substance particle washing nozzle process had the problem that contamination was fundamentally unsolvable, by the washing method of a nozzle, although it was automatable by the cylinder, and suction and regurgitation control with the magnetic substance.
Moreover, although a liquid phase process and a solid phase technique are usually used for an

immune-serum reaction In a liquid phase process, there is the same trouble as the aforementioned centrifuge method, and it also sets to a solid phase technique. That the variety filter for dissociating from the same trouble as a centrifuge method or solid phase support is required, and it is hard to carry out full automatic, the method using the solid phase support of varieties was difficult, and there is no suitable means to avoid un-unique combination, and it had the problem that a limitation was in high sensitivity and specific analysis.
The place which this invention is originated in view of this present condition, and is made into the purpose Only by combining at least two or more kinds of magnetic-substance particles with the 1st It aims at offering arts, such as DNA which can attain automatically a series of work of the indicator, measurement, etc. of isolation of extraction of capture of a cell, the dissolution of a nucleus, the dissolution of protein, DNA, etc., DNA, etc., DNA, etc. consistently. By combining with the 2nd the principle of "the various equipments processed by the desorption control method and this method of the magnetic substance using the distributive-pouring machine" (Japanese Patent Application No. No. 39425 [seven to]) which these the 1st principle and these people proposed previously Full automatic analyses, such as still more efficient DNA, can be attained, and it aims at offering arts, such as ideal DNA which can moreover secure prevention of perfect cross contamination. It aims at offering arts, such as DNA which is consistently performed by controlling two or more kinds of magnetic-substance particles also including processing of concentration, stirring, centrifugal separation, dialysis, etc. and which can reduction-ize an equipment scale and can cut down cost since things can be carried out, in the 3rd. While it is efficient, and reliability is good and being able to perform certainly quickly various processings which consist of many routings by using two or more kinds of magnetic-substance particles in the 4th properly, and choosing the optimal magnetic-substance particle as it by each routing, versatility and versatility are high.
Indication of invention If it is in arts, such as DNA using two or more kinds of magnetic-substance particles concerning the first invention, in order to attain the above-mentioned purpose Biopolymers, such as a cell, DNA and RNA, mRNA, a plasmid, a virus, or bacteria, Processing which consists of work of capture of a microorganism or the matter, extraction, recovery, isolation, amplification, an indicator, analysis, or measurement is automatically performed using two or more kinds of magnetic-substance particles which suited the work purpose.
Here, the work of capture, extraction, recovery, isolation, amplification, an indicator, analysis, or measurement is included with "processing." A "biopolymer" is a polymeric material compounded in the living body, and contains protein, nucleic acids (DNA, RNA, mRNA, etc.), a polysaccharide, etc. An immunity substance is also included in protein. A virus, a plasmid, bacteria, a cell, etc. are included in a "microorganism." The organic or inorganic chemical containing molecular biology-matter other than a biopolymer is included in the "matter." There is a kind by difference of the property of front faces, such as a size of for example, a magnetic-substance particle, a configuration, a material, physical properties, and porous existence, adhesion and a cementing material, or the coating matter of "being a kind two or more."
As a way "performed using two or more kinds of magnetic-substance particles which suited the work purpose" Combine the quality of a work object with a magnetic-substance particle indirectly through direct or other matter, and for example, a pipet means separates a magnetic-substance particle by exerting a magnetic field on a magnetic-substance particle. By removing a residual liquor, removing the magnetic-substance particle itself, or canceling a magnetic field, this magnetic-substance particle is made to suspend in liquid, and the quality of the specified substance is captured or it is carried out by carrying out quality of the specified substance, or these combination and repeats. Therefore, on condition that removal of the magnetic-substance particle used by the work preceded depending on the content of work, you may use the same new magnetic-substance particle.
Since the unnecessary matter which remains by the work which can be automatically consistent, and can perform quickly complicated processing which consists of a series of work, and is preceded can be removed without being based on washing etc. while raising the efficiency and reliability of each work, since the optimal magnetic-substance particle can be chosen by each work by using two or more kinds of magnetic-substance particles, it is highly precise and reliable processing can be carried out.
In case the liquid which made the magnetic-substance particle suspend by suction of liquid or the

regurgitation in the liquid path which connects the point and reservoir of a pipet means to a magnetic-substance particle is passed in order to exert a magnetic field on the aforementioned magnetic-substance particle for example, it carries out from the lateral surface of a liquid path. By this, a magnetic-substance particle can be efficiently separated from liquid, and concentration, capture, extraction, recovery, isolation, etc. can be performed.
With "it is automatic", it responds in the content of work, and sequence. For example, suction of a pipet means, Directions of the regurgitation and its number of times, specification of the position of the container containing a required sample or the magnetic-substance particle of required various kinds, Abandonment of a used magnetic-substance particle, a transfer of a container, directions of whether to do whether a magnetic field is done, the time of an incubation, etc. are programmed beforehand, and it carries out by giving directions with a signal to a distributive-pouring machine, a container transfer machine, a magnet, etc.
The pipet chip with which the pipet nozzle point of a distributive-pouring machine was equipped free [attachment and detachment] performs processing which the second invention becomes from the work of capture of biopolymers, such as the aforementioned cell, DNA and RNA, mRNA, a plasmid, a virus, or bacteria, a microorganism, or the matter, extraction, recovery, isolation, amplification, an indicator, analysis, or measurement in the first invention.
By this, even if it does not wash a pipet chip, it can process without cross contamination quickly efficiently.

The third invention performs the transfer between each routing, such as capture, extraction, recovery, isolation, amplification, an indicator, analysis, or measurement, for the magnetic-substance particle with which a biopolymer, a microorganism, or the specific matter combined the aforementioned pipet chip by suction of a sample or attachment-and-detachment control of the regurgitation and a magnet in the second invention.
The case where it connects to a magnetic-substance particle by the reaction by adhesion for example, to the magnetic-substance particle itself, adsorption to the predetermined matter with which the magnetic-substance particle was coated, adhesion, or the reacting matter etc. is included in "combination."
The fourth invention Biopolymers, such as a cell, DNA and RNA, mRNA, a plasmid, a virus, or bacteria, By making it combine with a magnetic-substance particle using the pipet chip equipped with a microorganism or the matter free [the attachment and detachment to the pipet nozzle point of a distributive-pouring machine], and performing refining processing of capture of a cell, the nucleus dissolution, or the protein dissolution Other magnetic-substance particles which DNA, RNA, or mRNA was extracted, next were coated with a probe, a biotin, or streptoavidin make a specific base sequence fragment isolate. Here, although the structure in which the heterocyclic compound which contained nitrogen in the sugar of an open chain compound with which the nucleic acid used as the main part of a gene consists of sugar and a phosphoric acid carried out the glycosidic linkage is taken, the thymine (T) which is this heterocyclic compound, a cytosine (C), AGUNIN (A), and the guanine (G) are made into the "base."
Fifth invention is performed to each routing, such as capture of biopolymers, such as the cell, DNA and RNA and mRNA using two or more aforementioned magnetic-substance particles, a plasmid, a virus, or bacteria, a microorganism, or the matter, extraction, recovery, isolation, amplification, an indicator, analysis, or measurement, through specific compatibility matter, such as immunoreaction or a complementary DNA, in either the first invention or the fourth invention.
The sixth invention incorporates amplification processes, such as DNA, RNA, or mRNA, in the fourth invention between capture of biopolymers, such as the cell, DNA and RNA and mRNA using two or more aforementioned magnetic-substance particles, a plasmid, a virus, or bacteria, a microorganism, or the matter, extraction, or a isolation routing.
Here, the base sequence fragment "forms in DNA, RNA, or mRNA" these is also included.
The cell for which the seventh invention used two or more aforementioned magnetic-substance particles in either the fourth invention or the sixth invention, Biopolymers, such as DNA, RNA, mRNA, a plasmid, a virus, or bacteria, Biopolymers, such as a specific base sequence fragment isolated after capture of a microorganism or the matter, extraction, or the isolation routing, The existence, such as a specific base

sequence fragment, a biopolymer, a microorganism, or the matter is measured for a microorganism or the matter through immunoreaction etc. in a chemiluminescence, fluorescence, or enzyme coloration.
The eighth invention is set to either the fourth invention or the sixth invention. A cell, Biopolymers, such as DNA, RNA, mRNA, a plasmid, a virus, or bacteria, By making it combine with a magnetic-substance particle using the pipet chip equipped with a microorganism or the matter free [the attachment and detachment to the pipet nozzle point of a distributive-pouring machine], and performing refining processing of capture of a cell, the nucleus dissolution, the protein dissolution, or immunoreaction DNA which extracted DNA, RNA, or mRNA, next was extracted if needed, A pipet chip is used after making it amplify about RNA or mRNA. An antibody, DNA specific by other magnetic-substance particles coated with a probe, a biotin, or streptoavidin, RNA or mRNA is made to isolate, next the specific existence and specific amounts, such as a base sequence fragment, are measured for this DNA of the isolated specification, RNA, or mRNA in a chemiluminescence, fluorescence, or enzyme coloration.
The process which is combined with the 1st magnetic-substance particle and captures the quality of the specified substance in a sample when the ninth invention makes the 1st magnetic-substance particle mix or stir by the pipet means in a sample, The process which separates the 1st magnetic-substance particle by which the quality of the specified substance was captured by the pipet means, and removes the residual liquor, The process which makes the quality of the specified substance dissociate from the 1st magnetic-substance particle by mixing or stirring the liquid for dissociation and the aforementioned 1st magnetic-substance particle for dissociating the aforementioned quality of the specified substance from a magnetic-substance particle, The process which removes this 1st magnetic-substance particle, the process which is combined with the 2nd magnetic-substance particle and captures this quality of the specified substance by the mixture or stirring by the pipet means, and the process which separates the 2nd magnetic-substance particle by which the quality of the specified substance was captured by the pipet means are included at least.
Here, a biopolymer, a microorganism, or the matter is included in "the quality of the specified substance." As for the dissociation front stirrup of the quality of the specified substance, not the thing that eliminates insertion of processes other than the process indicated by this invention but processing and the process which labels of for example, the quality of the specified substance may be added after dissociation. Therefore, the quality of the specified substance may change with progress of a process.
For example, a pipet means performs "separation by the pipet means" by exerting a magnetic field on the interior of a pipet means by making a magnetic-substance particle stick to the interior of a pipet means, suction or in case the regurgitation is carried out.
In this invention, it can progress to the following process by using exchanging two or more kinds of magnetic-substance particles, removing the various unnecessary matter used at the process to precede. Therefore, when continuing using the same magnetic-substance particle, the undesired substance which is accumulated at this magnetic-substance particle and remains can prevent the situation of having a bad influence on the reaction performed at the following process, or measurement, and can perform processing which has high degree of accuracy or reliability by high sensitivity.
It is the 3rd and the 4th further by repeating the processing using two kinds of magnetic-substance particles, without being restricted in the case concerned, although this invention explained the case where two kinds of magnetic-substance particles were used. -- A magnetic-substance particle can be used.
The tenth invention is DNA in which the aforementioned quality of the specified substance contains a base sequence fragment in the ninth invention. The front face of the aforementioned 1st magnetic-substance particle is porosity, and the aforementioned liquid for dissociation is pure water. the aforementioned 2nd magnetic-substance particle DNA by which it was coated or combined and a probe, a biotin, or streptoavidin was dissociated from the aforementioned 1st magnetic-substance particle After making it mix with a primer if needed using a pipet chip, putting a primer, DNA which reacted into PCR and amplifying DNA etc., The 2nd magnetic-substance particle is made to capture specific DNA which was made to biotin-ize this DNA etc. and biotin-ized it, it dissociates, and the process which is made to combine reacting matters, such as a chemiluminescence and fluorescence, after separation, and is measured is included.

the eleventh invention -- the ninth invention -- setting -- the aforementioned sample -- body fluid components, such as a blood serum, -- it is -- the quality of the specified substance -- an antigen or an antibody -- it is -- the [the aforementioned 1st magnetic-substance particle or] -- 2 magnetic-substance particle -- the aforementioned quality of the specified substance, and direct -- or other 1 or two or more intermediate products are minded, and the reactant is coated or combined specifically indirectly
Each invention constituted as mentioned above can attain automatically a series of work of indicators, such as isolation of extraction of capture of a cell, the dissolution of a nucleus, the dissolution of protein, DNA, etc., DNA, etc., and DNA, or measurement consistently only by combining at least two kinds of magnetic-substance particles.
Moreover, if it is in each invention, by combining the principle using the distributive-pouring machine proposed previously of desorption control of the magnetic substance, the two or more above-mentioned kinds of the 1st principle using a magnetic-substance particle and these people can attain full automatic analyses, such as still more efficient DNA, and can attain prevention of perfect contamination.
Furthermore, since it can carry out consistently by controlling two or more kinds of magnetic-substance particles also including processing of concentration, stirring, centrifugal separation, dialysis, etc., and a mechanism and control are very easy, an equipment scale can be reduction-ized and cost can be reduced [if it is in each invention,] sharply.
Furthermore, if it is in each invention, while being able to perform certainly quickly various processings which consist of many routings by using two or more kinds of magnetic-substance particles properly, and choosing the optimal magnetic-substance particle by each routing with reliability efficient and sufficient, versatility and versatility are high.
Easy explanation of a drawing Drawing 1 is the block diagram showing the rough composition of extraction / analysis equipments, such as DNA concerning the example of a position form of implementation of this invention.
Drawing 2 is work flow explanatory drawing showing the operation step of this equipment in order.
The best form which carries out this invention The example of a form of implementation of the first of this invention is hereafter explained in detail based on an accompanying drawing.
Drawing 1 used two kinds of magnetic-substance particles, the case where DNA analysis equipment is constituted combining the principle as which these people proposed these magnetic-substance particle previously is illustrated, and the routing according [drawing 2] to this DNA analysis equipment is shown roughly. Of course, this invention is applicable not only to the above DNA but processing of extraction of biopolymers, such as RNA, mRNA, a plasmid, a virus, or bacteria, a microorganism, or the matter, or analysis as quality of the specified substance.
As shown in drawing 2 , the pipet chip 2 with which the point of rise-and-fall ease and the pipet nozzle in which horizontal displacement is free is equipped free [attachment and detachment] by the XYZ move mechanism the DNA analysis equipment concerning this example of a form The container with which drive control was carried out so that the work of a sampling, reagent distributive pouring, the 1st magnetic-substance particle pouring, DNA adsorption, pure water suction, DNA capture, and primer pouring might be done, and this primer was poured in Then, the pipet chip 2 above-mentioned after multi-stage story heat-treatment is carried out by PCR3, multiplication of DNA is performed and this DNA multiplication work is completed Drive control is carried out so that the 2nd magnetic-substance particle may be poured in into the above-mentioned container, next pouring of alkali-treatment liquid, suction of a DNA penetrant remover, ****, a chemiluminescence, fluorescence, or enzyme color reaction may be performed.
The 1st magnetic-substance particle has a globular form as minute as homogeneity and 0.3-5 microns or less. Moreover, the front face is porosity, or many matter with which silica gel was mixed is used, and this magnetic-substance particle combines DNA etc. efficiently by adhesion on a front face etc., and can be collected.
The 2nd magnetic-substance particle manages a fixed quantity and a measurement reaction, and in order to capture a specific base sequence fragment and to use the high reaction of the compatibility of a biotin (Biotin) and streptoavidin (Streptavidin) between a probe, the front face of a magnetic-substance particle,

DNA, etc., while coating a magnetic-substance particle with the above-mentioned biotin or streptoavidin, streptoavidin or biotin-ized DNA is used.
PCR3 is constituted so that the process of being the well-known technique of increasing DNA and equipment, for example, cooling this to 40 degrees C, heating to 96 degrees C again and cooling to 40 degrees C after this after heating a sample to 96 degrees C may be repeated two or more times.
As for the measuring device which checks the existence in the sample of the purpose base sequence fragment, or an amount using a chemiluminescence, fluorescence, or enzyme coloration, the amount optical measuring unit of glimmering light with well-known PMT, spectrophotometer, etc. is used.
Next, the DNA analysis equipment which it comes to constitute as mentioned above explains the process which analyzes DNA based on drawing 2 .
First, a required reagent (SDS and protease) is poured distributively to the sample which it homogenized, and protein etc. is dissolved in it (Step a).
Then, the above-mentioned 1st magnetic-substance particle is poured into the sample sample which this protein etc. dissolved, DNA in a sample sample etc. is combined with this 1st magnetic-substance particle by physical adsorption etc., and it captures (Step b).
Next, after passing through a predetermined incubation, the sample in the above-mentioned container is attracted, the magnet M arranged in the exterior of this pipet chip 2 free [attachment and detachment] sticks to the peripheral face of the pipet chip 2, and the 1st magnetic-substance particle by which DNA etc. was captured is made to stick to the inside of a pipet chip (Step c).
Next, DNA etc. and the 1st magnetic-substance particle which attracted pure water as dissociation liquid and were captured by the 1st magnetic-substance particle are made to dissociate (Step d). At this time, drive control of the above-mentioned magnet M is carried out so that it may separate to the position distant from the pipet chip 2, i.e., the position where the influence of magnetism does not attain to the attracted sample.
Then, stick the above-mentioned magnet M to the peripheral face of the pipet chip 2 again, DNA etc. and pure water are made to separate in the state where only the 1st magnetic-substance particle was made to stick to the inside of the pipet chip 2, and chisels, such as DNA, are taken out and collected (Step e). Then, the above-mentioned 1st magnetic-substance particle is discarded.
Next, the above-mentioned pipet chip 2 mixes separated DNA with a primer (Step f).
Then, the above-mentioned primer, DNA which reacted are put in by the above PCR3, predetermined temperature heating (96 degrees C) and predetermined cooling (40 degrees C) are repeated, and multiplication of DNA is performed (Step g).
Next, the above-mentioned pipet chip 2 pours in the aforementioned 2nd magnetic-substance particle to which the indicator was attached for example, by biotin-ization and which was specifically coated with the good streptoavidin of compatibility with the biotin in the DNA sample amplified by PCR3 (Step h).
Then, after the above-mentioned pipet chip's 2 pouring alkali-treatment liquid distributively in this DNA sample (Step i), next attracting this DNA sample by which the alkali treatment was carried out and making this 2nd magnetic-substance particle stick to the inside of the pipet chip 2 with the above-mentioned magnet M, a wash water suction - Breathes out, the 2nd magnetic-substance particle is washed, and a specific base sequence fragment is isolated (Step j).
Next, this isolated base sequence fragment is combined with the particle which combined a chemiluminescence, fluorescence, or the enzyme color reaction matter with DNA, such as DNA, (Step k), and the existence of the target base sequence fragment is measured in it with the well-known amount optical measuring units of glimmering light, such as PMT and a spectrophotometer, or the amount is measured in it (Step l).
As explained above, in the example of a form of this operation, what chooses the thing which is easy to make it dissociate easily, joins together firmly as the 2nd magnetic-substance particle, and captures the quality of the specified substance efficiently with pure water is chosen by using a porous thing as the 1st magnetic-substance particle. Therefore, it can measure efficiently by dissociating the 1st magnetic-substance particle efficiently and collecting the quality of the specified substance. Moreover, by discarding the 1st magnetic-substance particle and transposing to the 2nd magnetic-substance particle, since the foreign matter which adheres to the 1st magnetic-substance particle and remains can be eliminated,

reliable measurement can be performed.
Next, the example of a form of the second operation which applied this invention to the immune-serum reaction is explained.
In the example of a form of the first operation, the first antibody joint magnetic-substance particle is used about an antigen and the 1st magnetic-substance particle instead of DNA. While using the third antibody using the second antibody for labeling, without using a primer and PCR and using other dissociating agents instead of the maceration by pure water An immune-serum reaction is realizable by using the third antibody which carried out [aforementioned] labeling, and the 2nd magnetic-substance particle which combined or coated the reactant specifically.
The case where the example of a form of this operation is applied to the CEA (gun fetal) antigen detection in a blood serum is explained.
At the 1st process, in each plate hole of the microplate for the first reaction, as the 1st magnetic-substance particle beforehand An anti-D NP mouse antibody joint magnetic-substance particle (the first antibody), DNP which has this anti-D NP mouse antibody and DNP which reacts specifically, and a biotin-ized anti-CEA mouse antibody (second antibody), as the ALP (alkaline phosphatase) indicator anti-CEA mouse antibody (the third antibody) which reacts with a luminescence substrate and emits light, and a dissociating agent -- the [a DNP-lysine and] -- the streptoavidin joint magnetic-substance particle is poured distributively in each plate hole with each reagent chip as a 2 magnetic-substance particle In addition, the matter which contains this antigen, an antibody and an antigen of the same kind, or an antibody as a dissociating agent in the case of joining together by the antigen-antibody reaction can be used.
At the 2nd process, a blood serum sample is attracted with the chip for a reaction, and it puts into the container for a reaction, and an incubation is performed, after pouring distributively DNA and the biotin-ized anti-CEA mouse antibody which are the aforementioned anti-D NP mouse antibody joint magnetic-substance particle which is the 1st magnetic-substance particle, and the second antibody in the aforementioned container for a reaction with a pipet chip and carrying out mixed stirring. Then, although it does not combine with the 1st magnetic-substance particle directly, this DNP and biotin-ized anti-CEA mouse antibody react specifically with the anti-D NP mouse antibody of the aforementioned 1st magnetic-substance particle, and the aforementioned CEA antigen which is the quality of the specified substance contained in a blood serum is connected while reacting specifically with DNP and a biotin-ized anti-CEA mouse antibody and connecting it. Therefore, it combines with the 1st magnetic-substance particle coated with the first antibody through the second antibody, and the aforementioned CEA antigen which is the quality of the specified substance is captured.
An incubation is performed after carrying out mixed stirring of this 1st magnetic-substance particle separated after dissociating by adsorbing the 1st magnetic-substance particle which captured the aforementioned CEA antigen by exerting a magnetic field on the interior by making a magnet approach the side of a pipet chip after an incubation etc. at the inside of a pipet chip etc. and removing a residual liquor at the 3rd process with an ALP indicator anti-CEA mouse antibody. By this, this ALP indicator anti-CEA mouse antibody reacts specifically with the nature slack CEA antigen of the specified substance captured by the aforementioned 1st magnetic-substance particle, and is combined.
At the 4th process, the 1st magnetic-substance particle which captured this CEA antigen and this ALP indicator anti-CEA mouse antibody is separated after an incubation by making it stick to an inside by exerting a magnetic field on the interior of a pipet chip. The CEA antigen which attracted the solution of the DNP-lysine which is a dissociating agent and was captured from this 1st magnetic-substance particle after removing the residual liquor, After dissociating the union object of an ALP indicator anti-CEA mouse antibody, DNP, and a biotin-ized anti-CEA mouse antibody, After separating and removing the 1st magnetic-substance particle, a pipet chip is used for a residual liquor, the streptoavidin joint magnetic-substance particle which is the aforementioned 2nd magnetic-substance particle is poured in, and mixed stirring is carried out. Then, a biotin-ized anti-CEA mouse antibody and the streptoavidin with which the 2nd magnetic-substance particle was coated react specifically among the aforementioned union objects, and this union object is captured by the 2nd magnetic-substance particle.
After separating after an incubation the 2nd magnetic-substance particle which captured this union object

by exerting a magnetic field on the aforementioned pipet chip and removing a residual liquor at the 5th process, a CEA antigen is analyzable by adding the luminescence substrate AMPPD by acting on the ALP indicator anti-CEA mouse antibody which forms the aforementioned union object, making it emit light, and measuring the amount of luminescence.

As shown above, while according to the example of a form of this operation choosing the optimal magnetic-substance particle by each work and raising the efficiency of each work by exchanging two or more kinds (here two kinds) of different magnetic-substance particles one by one, and using them, the bad influence to work can be eliminated. For example, in the above-mentioned example, the matter with which the 1st magnetic-substance particle was coated can dissociate the quality of a prize easily by the dissociating agent, and can be efficiently measured by the 2nd magnetic-substance particle holding the quality of a prize by firm combination. Moreover, the coating matter of the 1st magnetic-substance particle has eliminated the influence which it has on the work after measurement etc. moreover, the survival of various unnecessary matter which was used by the routing to precede according to the example of a form of this operation -- ease -- and it is fully removable By this, routings, such as measurement of the back with sufficient reliability, can be guaranteed by high sensitivity.

In addition, although the 2nd magnetic-substance particle coated with streptoavidin in the example of a form of the first operation to DNA made to biotin-ize is made to capture, in the case concerned, this invention is not restricted and can process analysis measurement of DNA etc. by the hybridization method using [for example,] the probe. Furthermore, the aforementioned magnetic-substance particle is made to coat with Oligo dT, and mRNA is captured in the liquid which dissolved extracted RNA, and you may make it compound cDNA in it using reverse transcriptase from captured mRNA by mixing this magnetic-substance particle. Furthermore, the magnetic-substance particle which coated the liquid which made biotin-ized mRNA hybridize cDNA with streptoavidin is made to pour distributively, and biotin-ized mRNA is combined with this magnetic-substance particle. Then, this magnetic-substance particle is made to capture cDNA hybridized by making a magnet approach, and you may make it make them collect.

Although the above-mentioned example of a form explained taking the case of the case where DNA etc. is analyzed using two kinds of this magnetic-substance particle, of course, it can also constitute so that it may not be limited to this if it is in this invention, and the above-mentioned analysis work may be done using three or more kinds of magnetic-substance particles. For example, in the example of a form of the first operation, in case a cell is extracted after making the organization smallness intercept cut down from the body tissue homogenize, in case a cell is extracted, when coating etc. makes a ligand or an acceptor other magnetic-substance particles, a cell can be extracted using this magnetic-substance particle. Although the above example was applied mainly to the processing about a biopolymer, this invention cannot be overemphasized by that it is applicable to processing of the chemical containing organic or inorganic for example, without being restricted when applying to these matter.

Claim [1997 year 7 month 28 day (28.07.97) international secretariat acceptance of a revision: The claim besides; by which the claims 1 and 2 of the time of application were amended has no change. (4 pages)]

1. (after amendment) A cell, DNA and RNA, mRNA, a plasmid, Quality of the specified substance, such as a biopolymer, is received in a series of processings which consist of two or more work of capture of biopolymers, such as a virus or bacteria, a microorganism, or the matter, extraction, recovery, isolation, amplification, an indicator, analysis, or measurement. The art of the biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles characterized by carrying out automatically by making two or more kinds of magnetic-substance particles which suited the work purpose combine or dissociate one by one.

2. (after amendment) The aforementioned cell, DNA and RNA, mRNA, a plasmid, A series of processings which consist of two or more work of capture of biopolymers, such as a virus or bacteria, a microorganism, or the matter, extraction, recovery, isolation, amplification, an indicator, analysis, or measurement The art of the biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles according to claim 1 characterized by carrying out with the pipet chip with which the pipet nozzle point of a distributive-pouring machine was equipped free [attachment and detachment].

3. It is the art of the biopolymer, microorganism, or matter using two or more kinds of magnetic-substance

particles according to claim 2 characterized by the aforementioned pipet chip performing the transfer between each routing, such as capture, extraction, recovery, isolation, amplification, an indicator, analysis, or measurement, for the magnetic-substance particle which a biopolymer, a microorganism, or the specific matter combined by suction of a sample or attachment-and-detachment control of **** and a magnet.
4. Biopolymers, Such as Cell, DNA and RNA, MRNA, Plasmid, Virus, or Bacteria, By making it combine with a magnetic-substance particle using the pipet chip equipped with a microorganism or the matter free [the attachment and detachment to the pipet nozzle point of a distributive-pouring machine], and performing refining processing of capture of a cell, the nucleus dissolution, or the protein dissolution The art of the biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles to which other magnetic-substance particles which DNA, RNA, or mRNA was extracted, next were coated with a probe, a biotin, or streptoavidin are characterized by making a specific base sequence fragment isolate.
5. It is the art of the biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles according to claim 1 to 4 characterized by doing each work of capture of biopolymers, such as the cell, DNA and RNA and mRNA using two or more aforementioned magnetic-substance particles, a plasmid, a virus, or bacteria, a microorganism, or the matter, extraction, recovery, isolation, amplification, an indicator, analysis, or measurement through specific compatibility matter, such as immunoreaction or a complementary DNA.
6. Art of biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles according to claim 4 characterized by incorporating amplification processes, such as DNA, RNA, or mRNA, between capture of biopolymers, such as cell, DNA and RNA and mRNA using two or more aforementioned magnetic-substance particles, plasmid, virus, or bacteria, microorganism, or matter, extraction, or isolation routing.
7. Cell, DNA and RNA, MRNA Using Two or More Aforementioned Magnetic-Substance Particles, Biopolymers, such as a plasmid, a virus, or bacteria, a microorganism, or capture of the matter, Biopolymers, such as a specific base sequence fragment isolated after extraction or the isolation routing, A microorganism or the matter in a chemiluminescence, fluorescence, or enzyme coloration Existence, such as the specific base sequence fragment, The art of the biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles according to claim 4 to 6 characterized by measuring a biopolymer, a microorganism, or the matter through immunoreaction etc.
8. Biopolymers, Such as Cell, DNA and RNA, MRNA, Plasmid, Virus, or Bacteria, By making it combine with a magnetic-substance particle using the pipet chip equipped with a microorganism or the matter free [the attachment and detachment to the pipet nozzle point of a distributive-pouring machine], and performing refining processing of capture of a cell, the nucleus dissolution, the protein dissolution, or immunoreaction DNA which extracted DNA, RNA, or mRNA, next was extracted if needed, A pipet chip is used after making it amplify about RNA or mRNA. An antibody, DNA specific by other magnetic-substance particles coated with a probe, a biotin, or streptoavidin, RNA or mRNA is made to isolate. next, this isolated DNA, RNA, or mRNA The art of the biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles according to claim 4 to 7 characterized by measuring the specific existence, specific amounts, etc., such as a base sequence fragment, in a chemiluminescence, fluorescence, or enzyme coloration.
9. Process Which is Combined with 1st Magnetic-Substance Particle and Captures Quality of Specified Substance in Sample by Making 1st Magnetic-Substance Particle Mix or Stir by Pipet Means in Sample, The process which separates the 1st magnetic-substance particle by which the quality of the specified substance was captured by the pipet means, and removes the residual liquor, The process which makes the quality of the specified substance dissociate from the 1st magnetic-substance particle by mixing or stirring the liquid for dissociation and the aforementioned 1st magnetic-substance particle for dissociating the aforementioned quality of the specified substance from a magnetic-substance particle, The process which removes this 1st magnetic-substance particle, and the process which is combined with the 2nd magnetic-substance particle and captures this quality of the specified substance by the mixture or stirring by the pipet means, The art of the biopolymer, microorganism, or matter using two or more kinds of

magnetic-substance particles characterized by including at least the process which separates this 2nd magnetic-substance particle by the pipet means.
The Aforementioned Quality of Specified Substance is DNA Containing Base Sequence Fragment Etc., Front Face of the Aforementioned 1st Magnetic-Substance Particle is Porosity, and the Aforementioned Liquid for Dissociation is Pure Water. 10. The Aforementioned 2nd Magnetic-Substance Particle DNA by which it was coated or combined and a probe, a biotin, or streptoavidin was dissociated from the aforementioned 1st magnetic-substance particle After making it mix with a primer if needed using a pipet chip, putting a primer, DNA which reacted into PCR and amplifying DNA etc., Make the 2nd magnetic-substance particle capture specific DNA which was made to biotin-ize this DNA etc. and biotin-ized it, and it dissociates. The art of the biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles according to claim 9 characterized by including the process which is made to combine reacting matters, such as a chemiluminescence and fluorescence, after separation, and is measured.
11. the aforementioned sample -- body fluid components, such as a blood serum, -- it is -- the quality of the specified substance -- an antigen or an antibody -- it is -- the [the aforementioned 1st magnetic-substance particle or] -- 2 magnetic-substance particle -- the aforementioned quality of the specified substance, and direct -- or the art of the biopolymer, microorganism, or matter using two or more kinds of magnetic-substance particles according to claim 9 characterized by minding other 1 or two or more intermediate products, and coating or combining the reactant specifically indirectly

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[Translation done.]

NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
The control method and its equipment technical field of the magnetic-substance particle by the distributive-pouring machine This invention relates to the control method of the magnetic-substance particle by the distributive-pouring machine which it dissociates [machine] from liquid using magnetism, or makes liquid suspend the magnetic-substance particle which combined the quality of the specified substance, and its equipment.
Technical background In the biotechnology field, the method of separating only the quality of the specified substance made into an object out of a solution comes to be used using a magnetic-substance particle, and it is widely applied to an immunoassay, DNA highness buri die SESHON, PCR, separation of a cell, proteinic separation, or washing in recent years.
When separating the quality of the specified substance using such a magnetic-substance particle, the piston of a syringe-like cylinder by carrying out elevation operation by the handicraft Attract the liquid which the magnetic-substance particle contained and a magnet arrangement part is made to carry out the uptake of the magnetic-substance particle in a solution by operation of the magnet arranged by the outside of the container (liquid reservoir) of the above-mentioned cylinder or the distributive-pouring chip section into this suction process. The technique into which make a magnetic-substance particle stick to the inside of the distributive-pouring chip section, and a magnetic-substance particle is made to divide by dropping the above-mentioned piston and making a solution discharge after that can be considered.
And when the magnetic-substance particle which was carrying out the uptake when the above-mentioned piston is raised again, it attracts other solutions in a chip and the operation of magnetism to a magnetic-substance particle was made to cancel, after separating a magnetic posture child from a solution suspends in a solution and a piston is dropped from this state, the solution which the magnetic-substance particle suspended from the inside of a chip is made to discharge.
such business -- the separation method or the suspension method by technique -- actual -- highly-precise-izing and high-sensitivity-izing of attachment and detachment of a pipet chip, magnetic contiguity, alienation, relative-position control, and separation and stirring / washing work of a magnetic-substance particle -- business -- it is impossible to carry out by technique, and in order to control a magnetic-substance particle organically and with high precision, the distributive-pouring system made to mechanize highly is indispensable
Furthermore, in order to exert a magnetic field operation on a magnetic-substance particle and to control to high sensitivity, complicated and delicate composition, such as magnetic field strength of the magnet, and configurations, such as a cylinder, an operating condition, is required.
This invention is originated in view of this present condition. this invention aims at offering the control method of the magnetic-substance particle by the improved distributive-pouring machine, and its equipment in the 1st.
It is the distributive-pouring machine with which this invention was highly mechanized in the magnetic-substance particle by the 2nd. In order to enable various operation of not only separation and movement of a mere magnetic-substance particle but stirring, washing, re-suspension, mixture, etc. It aims at offering the control method of the magnetic-substance particle by the distributive-pouring machine aiming at performing control which has highly precise fixed quantity nature and reliability in various

operation, and its equipment by performing the speed of suction and the regurgitation, an amount, a repetition rate, or its combination.
this invention aims at offering the control method of the magnetic-substance particle by the distributive-pouring machine which enables precise and complicated control, and its equipment in the 3rd by exerting a magnetic field on high sensitivity to a magnetic-substance particle.
this invention aims at offering the control method of the magnetic-substance particle by the distributive-pouring machine for easy operation performing control accompanied by various operation which is complicated and is reliable, and its equipment in the 4th.
this invention aims at offering the control method of the magnetic-substance particle by the distributive-pouring machine which can set up and direct automatic the most efficient and high-speed processing, and its equipment in the 5th.
It is safe and this invention aims at offering the control method of the magnetic-substance particle by the distributive-pouring machine which can perform processing with reliability without contamination, and its equipment in the 6th.
this invention aims at offering the control method of the magnetic-substance particle by the distributive-pouring machine which is implementable with easy and cheap composition, and its equipment in the 7th.
this invention aims at offering the control method of the magnetic-substance particle by the distributive-pouring machine which has the versatility which can direct various motion control, and is flexible, and its equipment in the octavus by setting up various processing patterns.
Indication of invention In order to make the above-mentioned purpose attain, the control method of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 1 In case the liquid which made this isolation-region section of the pipet section which has the isolation-region section by which a magnetic field operation is done in the liquid path which connects a point and the reservoir section, and carries out suction of liquid or the regurgitation suspend a magnetic-substance particle is passed It is characterized by including the process which makes a magnetic-substance particle separable from liquid by exerting a magnetic field operation on the aforementioned isolation-region section from the lateral surface of a liquid path, and making a magnetic-substance particle stick to the medial surface of a liquid path.
Here, in a "point", liquid says the portion which flows and flows out, and as long as only the portion of the mouth at the nose of cam of the pipet section has the portion which is tapering off towards the nose of cam along with it, it may include it.
A "reservoir" means the container portion which stores the attracted liquid.
Moreover, a "liquid path" is a portion which connects between a point and reservoirs (it is open for free passage), and this portion is a portion mainly used for passage of liquid, and is a portion in which the field controlled by this portion so that the inferior surface of tongue of the liquid which flows out of the attracted liquid or the reservoir at least passes is included.
It is because it is possible not to leak the all magnetic-substance particle which will be made to pass all the liquid if the isolation-region section is prepared in the portion concerned, since the field controlled so that the inferior surface of tongue of the liquid which flows out of the liquid attracted from the point as having prepared the isolation-region section in the "liquid path" mentioned the liquid path above in the 1st, or a reservoir passes is included, and is suspended in liquid, and to catch.
Since the 2nd has few limits of the configuration of forming the structure which gives the capacity beyond the grade which maintains the volume of the container which the pipet section prepared caudad since the liquid path was not a field for storing liquid like a reservoir, or supports the pipet section, it can form thinly in a liquid path so that a magnetic field operation may fully be done.
If it controls by the isolation-region section so that the inferior surface of tongue of the liquid which flows out of the liquid or the reservoir attracted from the aforementioned point passes, all magnetic-substance particles can be captured.
Preferably, preparing this isolation-region section in the portion from which the flow by which the size of a liquid path was uniformly formed and was stabilized is acquired tends to capture a magnetic-substance particle.

Moreover, if too not much close to a point when there is a thinner point for example, it is easy to raise a * ** ball, and in order to pass all liquid, it is necessary to raise the inferior surface of tongue of liquid in upper part past ******.
Moreover, even if it is a liquid path, a size cannot fully exert a magnetic field on a magnetic-substance particle in a comparatively thick portion. These are taken into consideration and the magnetic field field section is set up.
A "reservoir", and a "liquid path" and a "point" can be distinguished also in a difference of configurations, such as others [difference / the function mentioned above], for example, a size etc., and the way of the control about the liquid in it.
Preferably, a "reservoir" is formed in the thickest portion in three in order to maintain the volume of a container. a "point" For example, in order to perform the suction regurgitation smoothly, it forms so that it may be tapering off toward a nose of cam, and since it is the portion which is a portion for passing liquid and prepares the isolation-region section, a "liquid path" is formed, for example so that a size may become fixed at slight thinness as compared with a "reservoir."
It is the portion in which the liquid in a container and contact are [that insertion into the container which the "pipet section" is prepared in a distributive-pouring machine, and exists caudad is possible, and] possible, and suction of liquid or the regurgitation is performed. Moreover, it fixes only not only in what is prepared possible [desorption] like the pipet chip which can be thrown away, and may be attached.
According to this method, the isolation-region section of the magnetic-substance particle of the pipet section can be made to be able to pass magnetic-substance particle suspension at predetermined speed, and the uptake of the magnetic-substance particle can be carried out to the medial surface of the liquid path in the strong one of the magnetic field of the isolation-region section.
In this invention, the part which carries out the uptake of the magnetic-substance particle is not the point of the pipet section, or the reservoir section, either, and important one has it in the point of carrying out a uptake at the liquid path to which it is connected. Although it corresponds when making sources of a magnetic field, such as a magnet, contact the outside of a reaction container when carrying out a uptake in the reservoir section which is easy to start blinding as mentioned above, and needs the almost same capacity as the capacity of a reaction container when a uptake is carried out near the point of the pipet section, and carrying out the uptake of the magnetic-substance particle In this case, uptake time is taken for a long time, and moreover, a collection efficiency is also low and it is for [according to / stirring] re-being hard to suspend further.
Here, "predetermined speed" is a speed which fully attains the capture purposes including the case where the particle size of a magnetic-substance particle, the property of a magnetic-substance particle, the content of a magnetic-substance particle, and the fixed quantity that becomes settled according to the adsorption capacity force of the source of a magnetic field are required etc., such as the accuracy of measurement.
What combined the quality of the specified substance is used for a "magnetic-substance particle" by coating the matter which combines for example, the quality of the specified substance by adsorption or the reaction.

About the matter which does not combine and condense only the condensed quality of the specified substance for this reaction including a condensation (solidification) reaction, either, it can leave in liquid, without making it join together.
the time of the source of a magnetic field prepared free [generating of a magnetic field and disappearance] generating [method / which was indicated by the claim 2] a magnetic field in the method indicated by the claim 1, as for the isolation-region section of the aforementioned pipet section -- or contiguity -- when the source of a magnetic field prepared free / alienation / approaches a liquid path, it is characterized by to be the field surrounded by the inside of the liquid path where a magnetic field operation is done
Here, not only a permanent magnet but the electromagnet using the solenoid or the electromagnet using the solenoid formed with the superconductor is included with "the source of a magnetic field."
In the method indicated by the claim 3, the isolation-region section of the above-mentioned pipet section is prepared so that it may be contained in a strong magnetism field required in order to separate a magnetic-substance particle.

It is the field which is that a magnet carries out the uptake of the magnetic-substance particle, and a "strong magnetism field" can be stuck to an inside and where an adsorption power is to some extent strong here. the field The configuration of the iron core put in into a permanent magnet, a coil, or a coil, number of turns, the quality of the material, It becomes settled by the time of properties, such as particle size of volume, the cross section, an installation position (existence of distance, an obstruction, etc.), a magnetic field H, flux density B, temperature, and the target magnetic-substance particle, and a content, suspension (viscosity, suspension state, etc.), a container, and a magnet etc. Generally a magnetic adsorption power is estimated by product F-L with the distance L from the magnetic strength F and a magnet. That is, what has the large work for fully removing the magnetic-substance particle for which the magnet was adsorbed, and which changed into the adhesion state in the distance is estimated that an adsorption power is strong. This product is proportional to the product electronu volt of the recoiling product e and the magnet volume V in approximation. It is the field where this value becomes larger than the work value which can draw the microbody particle in the position L near the magnet.

For example, if a magnetic field and flux density are made into a predetermined size, the field will become to the permanent magnet of predetermined volume with the cross section with a diameter of about 3mm within the limits whose distance to a permanent magnet is about 2mm.

Moreover, the method indicated by the claim 4 drives the source of a magnetic field so that contiguity alienation may be carried out to the axial center of a liquid path.

It is desirable when attracting and carrying out the regurgitation of the liquid to the grade from which sufficient effect for the separation purpose is acquired at a late speed completeness-izes a collection efficiency more at the time of suction and the regurgitation of liquid at the time of the separation work of a magnetic-substance particle according to the method furthermore indicated by the claim 5. for example, the speed which carried out suction and regurgitation speed of liquid slowly when the magnetic-substance particle which liquid contains by hyperviscosity was a weak magnetization nature particle -- or although suction and the regurgitation of multiple times are needed, when the magnetic-substance particle which liquid is hypoviscosity and contains is a strong magnetization nature particle, it may be enough just to perform suction and the regurgitation of liquid once

The method indicated by the claim 6 is characterized by being constituted so that the uptake of the magnetic-substance particle may be carried out in the process which carries out whole-quantity suction and carries out the regurgitation of the sample of a constant rate where the magnetic-substance particle suspension of a constant rate is mixed in the method of a claim 1 or either of 5.

Since one of the most important points can separate only a particle with high precision about the solution whole quantity in this invention, it is the point that perfect fixed quantity control can be performed, by controlling volume correctly.

In the method of a claim 1 or either of 6, the method indicated by the claim 7 is characterized by carrying out drive control so that the inferior surface of tongue of the attracted liquid may be raised in the position more than the soffit region of the aforementioned isolation-region section, when whole-quantity suction of the liquid is carried out.

Since all the magnetic-substance particles contained in liquid can be captured by this, control of a high precision can be performed about a fixed quantity.

The method indicated by the claim 8 transports this to other positions, while it had made the magnetic-substance particle by which the uptake was carried out by the method of either a claim 1 or the claim 7 stick to the liquid path inside of the pipet section, and it is this position. It is characterized by constituting so that required processing to quality of the specified substance prepared for this position, such as a reaction with liquid, churning, and washing, may be performed.

According to this method, it becomes possible to transport to others and a position, while only the magnetic-substance particle which the quality of the specified substance combined from the suspension of a magnetic-substance particle and a sample had been made to stick to the liquid path inside of the pipet section, and mixture of a reagent can also perform separation, stirring, and washing efficiently the minimum condition in each position as compared with the case where it is made to stick to a container inside.

the speed which produces the effect of the purpose work when reacting, stirring or washing the method indicated by the claim 9 about a magnetic-substance particle, a reagent, or a penetrant remover -- it is -- suction and the regurgitation speed of the liquid at the time of separation of the aforementioned magnetic-substance particle -- high speed -- liquid's suction - breathing out -- and multiple times -- it is characterized by to constitute so that this may repeat

Since the magnetic-substance particle is sticking to the aforementioned liquid path inside of the pipet section, this Since there is a possibility that fluid pressure may not break away easily [it is small and / a magnetic-substance particle] from the aforementioned liquid path inside of the pipet section even if it repeats suction and the regurgitation at a late speed, So that the fluid pressure to which a magnetic-substance particle secedes from the liquid path inside of the pipet section certainly and efficiently may be obtained suction and regurgitation speed of the liquid at the time of separation of the above-mentioned magnetic-substance particle -- high speed -- liquid's suction - breathing out -- and multiple times -- stirring with a particle and liquid, washing, etc. can be effectively worked by repeating this

for example, when a re-suspensibility is bad and fine magnetic susceptibility has the state of a magnetic-substance particle where it is sticking to the liquid path inside in the aforementioned isolation-region section of the pipet section, by the shape of a pellet The above-mentioned stirring / washing work is high speed, and suction and the number of times of **** are also set as about ten times.

Moreover, the state of a suspensibility of a magnetic-substance particle where it is sticking to the aforementioned liquid path inside of the pipet section is good at the shape of a non-pellet, when there is no magnetic susceptibility, the above-mentioned stirring / washing work is high speed a little, and suction and the number of times of **** are also set as 10 or less times.

In addition, since the control section of the above-mentioned distributive-pouring machine can control correctly the oil-level maximum rise position of pipet circles at this time, at the time of suction of a next penetrant remover, this maximum rise position is recognized, a penetrant remover is attracted to the position above this maximum rise position, and it also becomes possible to raise the washing efficiency of the pipet section.

The method indicated by the claim 10 is characterized by performing the soffit section of the pipet section in the state where you made it surely immersed into a reagent or a penetrant remover in the method indicated by claims 8 or 9 the ** case which attracts liquid at high speed and breathes it out.

According to this method, air bubbles cannot mix into liquid and prevention of mutual mixture of the reagent by survival of the solution by adhesion of the bubble of pipet circles, the fall of fixed quantity nature, and carry-over of the bubble of pipet circles can be aimed at.

The above-mentioned pipet section is the pipet chip with which 1 or two or more nozzles which were prepared in the distributive-pouring unit were equipped respectively free [attachment and detachment], and the method indicated by the claim 11 is characterized by performing the method of a publication to a claim 1 or either of 10 simultaneously, when two or more nozzles are equipped with each pipet chip.

According to this method, it can become possible to process simultaneously processing of liquid in which plurality was put in order, with each pipet chip, and a throughput can be raised.

The method indicated by the claim 12 is set to the method of a claim 1 or either of 11, as shown in a view 1. Reaction conditions, such as time of matter conditions, such as a kind about matter, such as quality of the specified substance, such as a sample, and a magnetic-substance particle, quantity, or a hold position, and an incubation, or temperature, Or the directions information containing operating conditions, such as existence of adsorption of the magnet formed in the existence, the position, the time, the sequence, the number of times, the speed, or the distributive-pouring machine of the suction and the regurgitation by the distributive-pouring machine, is inputted (S100). Based on the directions information inputted at least, analyze the content of directions required for processing execution (S101), and by the analyzed content of directions by ****** The processing pattern which a distributive-pouring machine or a container concrete supply system should perform is determined (S102), and it is characterized by what processing execution is directed for based on the determined processing pattern concerned (S103) to the aforementioned distributive-pouring machine or a container concrete supply system.

Although illustrated above, the content of particle size, such as quality of the specified substance, such as others, for example, a sample etc., and a magnetic-substance particle, and a magnetic-substance particle etc. is included in matter conditions.
"Based on the directions information inputted at least", since it is, in part, it may be based on the information registered beforehand, or may be based on the measured value by simulation operation by the distributive-pouring machine.
According to this method, the pattern which a processing pattern is not fixed and is needed for processing can be set up arbitrarily. Moreover, since the processing pattern which is adapted for various reaction patterns by setting up the control condition of the separation work of a magnetic-substance particle, stirring work, and washing in processing conditions which do not need to register all from the beginning and become the most efficient about a processing pattern or a processing step if needed can be performed easily, the versatility or versatility of processing becomes high.
Moreover, the pipet section which has the isolation-region section by which a magnetic field operation is done in the liquid path to which the equipment indicated by the claim 13 connects a point, a reservoir, the point concerned, and a reservoir, and the liquid path concerned, The distributive-pouring unit which negative pressure or the liquid which pressurized and suspended the magnetic-substance particle in the aforementioned pipet circles is attracted [unit], or makes the pipet circles concerned breathe out, It is characterized by having the source of a magnetic field, the source driving gear of a magnetic field which drives the source of a magnetic field in order to do or remove a magnetic field operation from the lateral surface of a liquid path to the aforementioned isolation-region section, and the control unit which performs control to the aforementioned distributive-pouring unit and the aforementioned source driving gear of a magnetic field.
Here, it is as having mentioned above about the "point", the "reservoir", and the "liquid path."
All the magnetic-substance particles to which it stuck can be made to suspend in liquid by composition of this equipment by making all the magnetic-substance particles in liquid stick to the medial surface of a liquid path, or removing a magnetic field operation with the aforementioned source driving gear of a magnetic field, by exerting a magnetic field operation on the isolation-region section of the aforementioned liquid path.
Therefore, in the state where the separated magnetic-substance particle was made to stick to the liquid path medial surface of the pipet section, efficiently, it is high sensitivity and movement of a magnetic-substance particle, mixed stirring with other liquid or washing, a reaction, etc. can be automatically performed with sufficient reliability at a high precision in a short time.
In the equipment of a claim 13, a control unit performs control to the aforementioned distributive-pouring unit, the aforementioned source driving gear of a magnetic field, and a container concrete supply system while equipment given in a claim 14 prepares the container concrete supply system which transports a container to the target position further.
According to this, it is transportable with a container concrete supply system not only about movement of a distributive-pouring unit but the container itself to be used. Therefore, as compared with movement of only a distributive-pouring unit, without making time useless, continuously, it is a high precision and two or more samples can be performed with sufficient reliability more efficiently and at high speed in a short time.

According to the claim 15, in claims 13 or 14, the aforementioned pipet section is a pipet chip with which a nozzle is equipped by attaching free [attachment and detachment of the nozzle prepared in opening of the aforementioned reservoir at the aforementioned distributive-pouring unit], and the aforementioned control unit is characterized by performing control of attachment and detachment with the aforementioned nozzle and the aforementioned pipet chip.
According to this invention, it equips with the pipet chip which the pipet section can detach and attach freely, and is made to perform it.
Therefore, while preventing contamination by throwing away the pipet chip used at once, there is no need for washing of the pipet chip itself, and it is easy to use.
Moreover, since processing of two or more samples can be performed using one nozzle by detaching,

attaching and using two or more pipet chips for one nozzle, it can process efficiently and efficiently.
according to a claim 16 -- equipment given in a claim 13 or either of 15 -- setting -- the aforementioned source of a magnetic field -- the liquid path lateral surface of the aforementioned pipet section -- receiving -- contiguity -- it is prepared free [alienation] or free [generating of a magnetic field, and disappearance], and the source driving gear of a magnetic field is characterized by to perform generating of the drive of the contiguity alienation to the aforementioned liquid path of the source of a magnetic field, or the magnetic field of the source of a magnetic field itself
according to the invention in this application -- generating disappearance of the magnetic field of the source of a magnetic field, or contiguity of the source of a magnetic field itself -- by the easy composition and easy operation of alienation, a magnetic-substance particle can be adsorbed and not only the transfer of a magnetic-substance particle but complicated processing of washing, suspension, etc. can be performed
in addition, generating disappearance of a magnetic field and contiguity of a magnetic field -- it is also possible to perform alienation in parallel
According to this invention, equipment can be manufactured cheaply and compactly with easy composition.

PIPETCHIPPU which has the isolation-region section by which a magnetic field is done in the thinner liquid path to which a point, a thicker reservoir, the tapering point concerned, and a tapering reservoir are connected, and a liquid path according to the claim 17, It attaches in opening of the aforementioned reservoir free [attachment and detachment of a nozzle]. the inside of the aforementioned pipet chip Negative pressure or the distributive-pouring unit which pressurizes, and attracts liquid for the aforementioned pipet chip, or is made to breathe out, the lateral surface of the aforementioned liquid path -- receiving -- contiguity -- the source of a magnetic field prepared free [alienation], and this source of a magnetic field to the aforementioned liquid path with the source driving gear of a magnetic field which carries out contiguity alienation operation, attachment and detachment with movement, and the aforementioned nozzle and the aforementioned pipet chip, and the aforementioned source driving gear of a magnetic field of the aforementioned distributive-pouring unit -- contiguity of the aforementioned source of a magnetic field to the aforementioned pipet chip -- it has the control unit which controls alienation
A control unit controls a distributive-pouring unit and the source driving gear of a magnetic field by composition of this equipment. Constant-rate suction of the sample which equips a pipet chip with a nozzle by the distributive-pouring unit, and is poured distributively by the reaction container is carried out at a pipet chip. By mixing with the liquid containing a magnetic-substance particle, making this attracted sample react, making a magnet approach the liquid path of a pipet chip with the source driving gear of a magnetic field, and performing suction and the regurgitation of the liquid to the pipet chip by the distributive-pouring unit The magnetic-substance particle which liquid was made to suspend is separated, it transports to other positions in the state where this separated magnetic-substance particle was made to stick to the liquid path inside of a pipet chip, and mixed churning of the magnetic-substance particle is carried out with other liquid. It can wash, and the quality of the specified substance can be extracted automatically and efficiently through a help in a short time, or it can be made to react.
In the equipment indicated by a claim 13 or 17, along with move tracing of the pipet section, beforehand, it prepares, the pipet section is moved along with this tracing, and the equipment indicated by the claim 18 is characterized [a reagent, a penetrant remover, etc. required for magnetic-substance particle suspension, the fixed quantity of the quality of the specified substance quality, extraction etc.] for each liquid by suction and constituting so that the regurgitation may be carried out requirements every.
By this, if it is in this equipment, as compared with the case where it is made to react with all reagents in the single container generally performed Repeat distributive pouring or suction, and the regurgitation to the same container, and it stirs further in the process. Since the work which requires the complicated machine mechanism which also performs washing of a reagent distributive-pouring nozzle, and delicate control serves as a machine configuration which can be performed only with the distributive-pouring machine using the pipet section, it can consider as the simplified equipment.
In the equipment with which the equipment indicated by the claim 19 was indicated by a claim 13 or either of 18 A reagent, a penetrant remover, etc. required for magnetic-substance particle suspension, the fixed

quantity of the quality of the specified substance, quality, extraction, etc. are beforehand prepared for the liquid hold section of a requirements [every] reaction container, and it is characterized by constituting so that each liquid stowage of this reaction container itself or a reaction container may be moved to the rise-and-fall position of the pipet section.
Thus, even if it is in this equipment, when carrying out consecutive processing of the work and two or more samples which require the complicated machine mechanism which repeats distributive pouring or suction, and the regurgitation to the same container, and also performs washing of stirring and a reagent distributive-pouring nozzle further in the process, and delicate control into reaction process each time with constituting, the complicated transfer control of a required reaction container is simplified sharply, and equipment can be miniaturized and low-cost-ized.
The equipment indicated by the claim 20 equips two or more nozzles of one distributive-pouring unit with the above-mentioned pipet chip respectively free [attachment and detachment] in the equipment indicated by a claim 13 or either of 19, and each [these] pipet chip is characterized by performing predetermined separation, stirring, and washing simultaneously.
Since the suspension of a magnetic-substance particle can be suction - Made to be able to breathe out simultaneously and separation of a magnetic-substance particle and stirring with other subsequent liquid, and washing can be simultaneously performed to the container put in order by two or more trains with this equipment, the processing number of cases per unit time increases sharply.
The kind concerning [the equipment indicated by the claim 21] matter, such as quality of the specified substance, such as a sample, and a magnetic-substance particle Reaction conditions, such as time of matter conditions, such as quantity or a hold position, and an incubation, or temperature, Or a directions information input means 200 to input the directions information containing operating conditions, such as existence of adsorption of the magnet formed in the existence, the position, the time, the sequence, the number of times, the speed, or the distributive-pouring machine of the suction and the regurgitation by the distributive-pouring machine A content analysis means 201 of directions to analyze the content of directions required for processing execution based on the aforementioned directions information that it was inputted at least, A processing pattern determination means 202 to determine the processing pattern with which a distributive-pouring machine or container ****** should follow based on the analyzed content of directions, and the registered information, It is characterized by having a processing pattern execution directions means 203 to direct processing execution based on the determined processing pattern concerned, to the aforementioned distributive-pouring machine or the aforementioned container concrete supply system.
Here, a "directions information input means" has an input by the case where it inputs by wearing of a floppy disk besides in the case of inputting by reading a worksheet (mark sheet) optically, or CDROM, the keyboard, or the mouse, an input by communication, etc.
According to this invention, the pattern which a processing pattern is not fixed and is needed for processing can be set up arbitrarily. Moreover, since the processing pattern which is adapted for various reaction patterns can be easily set up by choosing from the parameter of the separation work of a magnetic-substance particle, stirring work, and washing as arbitration processing conditions which do not need to register with a control unit from the beginning and become the most efficient about a processing pattern or a processing step if needed, the versatility or versatility of processing becomes high.
The equipment indicated by the claim 22 is characterized by for this point going up to the height which cannot touch a container, locating the bottom and the aforementioned point of the aforementioned container in point-blank range, and performing suction or the regurgitation, when the point of the pipet section was equivalent to the bottom of a container as submergence mode and the lowest edge has been recognized.
Since the point of the pipet section is located in the point-blank range of the bottom of a container and performs suction and the regurgitation with this equipment, the influence of distortion etc. of machine precision and plastics can be eliminated, and a uniform suction precision can always be acquired.
Moreover, the precision in the case of suction and the regurgitation of the whole quantity improves, and fixed quantity nature is also excellent.
The equipment indicated by the claim 23 is equipped with the distributive-pouring unit which has two or

more nozzles with which it can equip free [attachment and detachment] for the pipet chip of two or more, and is characterized by attaching the liquid level sensor which senses an oil level only to one of the aforementioned nozzles.
When the sample is held in two or more parent specimen containers, respectively, it is common for the oil level of the sample in each parent specimen container not to be fixed. When the amount of descent of each nozzle is uniformly controlled to the oil level of each [these] sample Since the volume which sticks to a pipet chip becomes irregular, although it is difficult to maintain fixed quantity nature with high precision, in this invention Since it constituted so that the oil level of each sample might be detected with the nozzle in which the liquid level sensor was attached only in one nozzle, and this liquid level sensor was attached and the sample of a constant rate might be attracted After the volume which sticks to a pipet chip becoming fixed, simplifying a mechanism and pouring distributively the liquid which control software is also easy liquid and was moreover attracted to a child specimen container Since an oil level becomes fixed, it can constitute so that suction and the regurgitation of subsequent liquid can be simultaneously performed with each nozzle, and the processing number of cases can be raised by the very easy mechanism.
The source driving gear of a magnetic field with which the equipment indicated by the claim 24 was indicated by either the claim 13 or the claim 23 is characterized by equipping with a magnet and a pinching object possible [movement in the direction which carries out contiguity alienation mutually].
Since according to this equipment it is constituted so that the liquid path of the isolation-region section of the pipet section may be made to carry out contiguity alienation of a magnet and the pinching object simultaneously, it becomes the structure where removal of the separation by the contiguity to the magnetic pipet section or the pipet section can be made to serve a double purpose, and equipment is simplified. Moreover, the position of a chip is correctly fixable.
The equipment indicated by the claim 25 is characterized by being constituted so that thermostats, such as a heat insulation warehouse, may be arranged in the aforementioned container installation-or bottle side of a reagent, a sample, a reagent, etc. may be heated to a required constant temperature and a reaction can be equalized in the equipment indicated by a claim 13 or either of 24.
In the equipment of claim 13 or claim 25 publication, the equipment indicated by the claim 26 is equipped with the test section which has cover structure, and is characterized by arranging the measuring device of radiation, such as optics, an electromagnetic wave, and an electron ray, in this test section.
Here, X-rays and gamma rays are also included in an electromagnetic wave.
Moreover, although not only electromagnetic waves, such as X-rays and gamma rays, but corpuscular rays, such as an electron ray and a proton beam, are included in a wide sense, it uses for "radiation" mainly in the sense of the latter here.
Thereby, a series of work of separation, stirring, washing, and measurement of a magnetic-substance particle can be full-automatic-ized, and this kind of complicated work can be realized by very easy mechanism and control.
The equipment indicated by the claim 27 is characterized by arranging the distributive-pouring nozzle which pours distributively reagents, such as a trigger reagent which is needed for the aforementioned test section at the time of measurement, in the equipment indicated by the claim 26.
In the case of the chemiluminescence enzymatic process (CLEIA) which measures the state where equipped with the trigger reagent distributive-pouring nozzle with this equipment in the case of the chemiluminescence method (CLIA) which needs a luminescence trigger reagent at the time of measurement, and luminescence became a plateau by the enzyme and the substrate liquid reaction, especially trigger reagent distributive pouring is unnecessary, and it becomes possible to perform the case of the both alternatively with the same equipment, respectively. Of course, PMT (photomultiplier tube) is used for a test section, and the measurement container and the trigger reagent distributive-pouring nozzle are constituted so that it may be in a perfect shading state between each.
the equipment indicated by the claim 28 -- either a claim 13 or the claim 27 -- in the equipment of a publication, it has the storage section which keeps the aforementioned pipet chip used in each process, such as separation, a reaction, stirring, and washing, about the predetermined sample possible [re-wearing] for every sample and with which it can be re-equipped

the equipment indicated by the claim 29 -- a claim 13 or either of 28 -- in the equipment of a publication, it is characterized by using what was covered by the thin film in opening of the container which poured the reagent distributively beforehand
the equipment indicated by the claim 30 -- a claim 13 or either of 29 -- in the equipment of a publication, after preparing based on the directions information directed about matter conditions, such as a kind of reagent, an amount, and a position, so that a reagent may be poured distributively in a container, it is characterized by controlling to perform original processing
According to this, since it does not pour distributively in a container beforehand, dryness and contamination of a reagent can be prevented and it can process flexibly.
Easy explanation of a drawing Drawing 1 is a control-flow view in this invention.
Drawing 2 is a control-block view in this invention.
Drawing 3 is processing explanatory drawing showing control processing of the magnetic-substance particle by the distributive-pouring machine in this invention in graph.
Drawing 4 is expansion partial longitudinal-section explanatory drawing showing the pipet chip circumference of this invention.
Drawing 5 is one block diagram of the equipment applied to the example of the 1st gestalt of the suitable operation for the immunological test based on a chemiluminescence method in this invention.
Drawing 6 is the front view of 4 run distributive-pouring unit applicable to this invention.
Drawing 7 is the perspective diagram showing the example of composition of the pinching object when processing in 4 run distributive-pouring unit, and the source of a magnetic field.
Drawing 8 is this pinching object and operation explanatory drawing of the source of a magnetic field.
Drawing 9 is the block diagram showing the control system of this equipment.
Drawing 10 is the block diagram showing the processing pattern setting means concerning the gestalt of operation.
Drawing 11 is the example of a screen which showed the item showing processing of the directions information concerning the example of the 1st gestalt.
Drawing 12 is a processing flow chart concerning the example of the 1st gestalt.
Drawing 13 is a timing diagram in the case of processing two or more samples.
Drawing 14 is the block diagram of the equipment concerning the example of the 2nd gestalt.
Drawing 15 is drawing showing a cartridge container.
Drawing 16 is the block diagram of the equipment concerning the example of the 3rd gestalt.
Drawing 17 is the block diagram of the equipment concerning the example of the 4th gestalt.
Drawing 18 is drawing having shown the container hold box concerning the example of the 4th gestalt.
Drawing 19 is the plan of the equipment concerning the example of the 5th gestalt.
Drawing 20 is the front view of the equipment concerning the example of the 5th gestalt.
Drawing 21 is explanatory drawing showing the rough composition of the equipment concerning the example of the 5th gestalt.
Drawing 22 is the block diagram showing the control system of the equipment concerning the example of the 5th gestalt.
The best gestalt for inventing Based on the example of a gestalt of operation shown in an accompanying drawing, it explains in detail hereafter.
The fundamental outline of processing of this invention is shown in drawing 3 .
The cartridge container C with which each liquid stowages 1A-1H in which a sign 1 is a container and the liquid of a container 1 is held here were made into seriates, such as a serial, and the shape of the shape of a loop and zigzag, and were formed in one is made to form. Suction of required liquid or the regurgitation is carried out for every H. the pipet chip P equipped with the upper part by the aforementioned nozzle -- moving -- each liquid stowages 1A-1 -- The magnet M which is suitably equivalent to the aforementioned source of a magnetic field approaches the liquid path of the pipet chip P, the uptake of the magnetic-substance particle 2 is carried out in the isolation-region section, and it dissociates from liquid, and it estranges and liquid is made to suspend the magnetic-substance particle 2.
And a sample is beforehand rough-poured distributively by liquid stowage 1A, and the reaction insoluble

magnetic-substance liquid 3 which the reaction insoluble magnetic substance of requirements contained is beforehand held in liquid stowage 1B. The penetrant remover 5 of requirements is beforehand held in the liquid stowages 1C and 1D, and the indicator liquid of requirements is beforehand held in liquid stowage 1E. Further, the penetrant remover 5 of requirements is beforehand held in the liquid stowages 1F and 1G, and substrate liquid is poured distributively by liquid stowage 1H, and each liquid of an initial complement is prepared so that all preparatory works required for analysis can perform.
In addition, the quality of the material of the reaction container 1 is formed at least with the quality of the material with a transparent pars basilaris ossis occipitalis, when it is formed with the opaque quality of the material which is not luminescence influenced of mutual when shading is needed like [in CLIA inspection or CLEIA inspection] and requires transparency of light like [in the case of spectrometry etc.] like [in EIA inspection].
The case where an optical measuring unit performs the amount measurement of luminescence as an analysis means of the immunochemistry detection method concerning this invention is explained.
First, specified quantity suction of the sample rough-poured distributively by liquid stowage 1A is carried out with the pipet chip P, and a fixed quantity is performed.
Next, after carrying out the whole-quantity regurgitation of the sample which transported the pipet chip P with which this sample was attracted, and was attracted by the reaction insoluble magnetic-substance liquid 3 in liquid stowage 1B, suction - Repeat the mixed liquor of this sample and reaction insoluble magnetic-substance liquid 3 with the pipet chip P, and make it breathe out (it is hereafter called suction and the regurgitation of liquid.). the mixed liquor by which generated the uniform churning mixed state of the magnetic-substance particle 2, and incubation was carried out after duration progress -- the above-mentioned pipet chip P -- the whole quantity -- or requirements suction is carried out
When passing isolation-region section 11a prepared in the liquid path 11 of the pipet chip P shown in drawing 4 , the uptake of the magnetic-substance particle 2 suspended in the mixed liquor attracted by the pipet chip P at this time is carried out to an internal surface with isolation-region section 11a of the liquid path 11 by the magnetism of the magnet M arranged in the outside of this pipet chip P. Moreover, the suction height of mixed liquor is attracted by the above-mentioned pipet chip P, and as shown in drawing 4 , when all mixed liquor is attracted, it is considered so that the uptake of the magnetic-substance particle 2 may be carried out completely so that the inferior surface of tongue may serve as more than a soffit region of isolation-region section 11a of the liquid path 11, i.e., near the soffit of Magnet M, and level beyond it.
Thus, after the uptake of the magnetic-substance particle 2 is carried out, the effluent of the mixed liquor except this magnetic-substance particle 2 is breathed out and carried out to liquid stowage 1B, and only the magnetic-substance particle 2 remains in the pipet chip P. Since the magnetic-substance particle 2 has got wet at this time, though it is held sticking to the inside of the liquid path 11 of isolation-region section 11a of the pipet chip P even if mixed liquor was discharged and the pipet chip P is transported, for example, it does not drop out indiscriminately.
Next, the pipet chip P is sent to the following liquid stowage 1C, with the uptake of the magnetic-substance particle 2 carried out, and attracts the penetrant remover 5 in liquid stowage 1C. At this time, Magnet M can be moved in the direction which separates from the pipet chip P, can keep away from aforementioned isolation-region section 11a, and can cancel the adsorbed state of the magnetic-substance particle 2, therefore can make a re-suspension state from suction and making it breathe out for this penetrant remover 5, and can wash the particle by the penetrant remover efficiently enough.
In the case of suction, it leaves some liquid. This is for preventing generating of the bubble by air suction. the water level of the solution before washing in any case -- the above -- the water level of a penetrant remover -- it is also important to control the amount of -
And after suction and the regurgitation of liquid are completed, the pipet chip P attracts slowly the penetrant remover 5 in liquid stowage 1C altogether. At this time, again, the uptake of the magnetic-substance particle 2 suspended in the penetrant remover 5 which approached the pipet chip P and was attracted is carried out altogether, the effluent of the penetrant remover 5 except this magnetic-substance particle 2 is breathed out and carried out to liquid stowage 1C, and, as for Magnet M, only the magnetic-substance particle 2 remains in the pipet chip P.

Next, the pipet chip P is sent to the following liquid stowage 1D, with the uptake of the magnetic-substance particle 2 carried out, and attracts the penetrant remover 5 in this liquid stowage 1D, and washing and uptake work of the magnetic-substance particle 2 are done in the same procedure as the procedure performed by liquid stowage 1C.
Next, the pipet chip P is sent to the following liquid stowage 1E, with the uptake of the washed magnetic-substance particle 2 carried out, and attracts the indicator liquid 6 in this liquid stowage 1E. Magnet M can be moved in the direction which separates from the pipet chip P, and the adsorbed state of the magnetic-substance particle 2 can be canceled, therefore the reaction of all the magnetic-substance particles 2 and indicator liquid 6 can be made to equalize this indicator liquid 6 by suction and making it breathe out at this time.
And after suction and the regurgitation of liquid are completed, the pipet chip P attracts slowly the indicator liquid 6 in liquid stowage 1E altogether after predetermined-time progress. At this time, again, the uptake of the magnetic-substance particle 2 suspended in the indicator liquid 6 which approached the pipet chip P and was attracted is carried out altogether, the effluent of the indicator liquid 6 except this magnetic-substance particle 2 is breathed out and carried out to liquid stowage 1E, and, as for Magnet M, only the magnetic-substance particle 2 remains in the above-mentioned pipet chip P.
Then, the pipet chip P is sent to the following liquid stowage 1F, with the uptake of the magnetic-substance particle 2 carried out, attracts the penetrant remover 5 in these liquid stowage 1F, and performs washing and the uptake of the magnetic-substance particle 2 in the same procedure as the liquid stowages 1C and 1D. In order to make the magnetic-substance particle which captured at once and became pellet-like fully suspend, it draws in and breathes out and a solution is made to stir an average of 10 to 15 times at high speed. Then, the following penetrant remover 5 of liquid stowage 1G is attracted in the same procedure as the penetrant remover suction procedure of liquid stowage 1F, and washing and the uptake of the magnetic-substance particle 2 are performed.
Then, it is transported to liquid stowage 1H, for example, luminescence continues after mixture with substrate liquid like CLEIA inspection, and, in the case of the measuring method which needs fixed time since the amount of luminescence is stabilized, the pipet chip P attracts the substrate liquid 7 beforehand held in these liquid stowage 1H. Magnet M can be moved in the direction which separates from the pipet chip P, and the adsorbed state of the magnetic-substance particle 2 can be canceled, therefore the reaction of all the magnetic-substance particles 2 and substrate liquid 7 can be made to equalize this substrate liquid 7 by suction of liquid and making it breathe out at this time.
And suction and the regurgitation of liquid are completed and the amount of luminescence is measured after predetermined-time progress.
The detail of the pipet chip circumference concerning the example of a gestalt is shown in drawing 4 . In here, 1 is a container, and in order to make a sample react, it constitutes the container with which the reagent, sample, or the magnetic-substance particle 2 of a complement is mixed. If it is used making this container 1 form as a cartridge container C which packed many containers 1 and was used as the cartridge, it can do work efficiently. Let capacity of each container 1 (1A-1H) be dozens - hundreds microliter.
The point 10 formed in the shape of [tapering] a cylinder toward the nose of cam where P is a pipet chip, the quality of the material is made into the product made from polypropylene, and ON appearance of liquid is performed, The liquid path 11 formed in the shape of [which has the same cross section which carried out the direct file in a point 10] a cylinder, Isolation-region section 11a on which the magnetic field operation in the liquid path 11 concerned is exerted, It has the reservoir 12 formed in the shape of [which was connected to the liquid path 11 through the cone section of inclination 7 degrees or less] a cylinder. About 4 millimeters of appearances and the thickness of the liquid path 11 which forms a flange 13 along the opening periphery of a reservoir 12, enables it to prevent deformation of opening, and has the aforementioned isolation-region section 11a are 1 millimeter or less. It is made for the liquid which has the fixed cross section and flows covering an overall length to flow by the rate of flow of abbreviation homogeneity. About 1 millimeter and thickness are as thin as about 0.5 millimeters, and an outer diameter carries out, makes length 20-30 millimeters, and makes a point 10 expand it from a nose of cam gently to the liquid path 11 so that the suction regurgitation of the liquid of a minute amount can be carried out.

N can be inserted in opening which was the nozzle of a distributive-pouring unit, formed in the point of a distributive-pouring unit (not shown), and established the nose of cam in the reservoir 12 of the pipet chip P free [attachment and detachment] -- as -- forming -- Nozzle N -- minding -- the inhalation of air of a distributive-pouring unit, or exhaust air -- following -- the interior of the pipet chip P -- negative pressure -- or it pressurizes

Contact M to the lateral surface of the liquid path 11 which is a magnet and is in isolation-region section 11a of the pipet chip P, or it is made to approach from the lateral surface to the range of a divisor millimeter, and carries out the uptake of the magnetic-substance particle suspended in liquid to the inside of the liquid path 11 with isolation-region section 11a.

The distributive-pouring unit (in the case of a multiple string, refer to drawing 6 [say / a nozzle unit]) 29 rotates a stepping motor (not shown) with the control signal from a control section, changes the rotation of the axis of rotation into reciprocation, operates piston 29b, and is exhausted from air supply or the pipet chip P for the pipet chip P through Nozzle N. moreover, the distributive-pouring unit 29 -- container 1from reaction container (not shown) A -- a distributive-pouring chip (not shown) -- using -- a sample -- pouring distributively -- further -- right above each containers 1B-1H -- moving -- respectively -- suction or in order to carry out the regurgitation -- free -- vertical movement or a parallel displacement -- or it constitutes so that flat-surface movement can be carried out

Below, based on the example of a gestalt shown in an accompanying drawing, it explains in detail about the system which used the above-mentioned pipet chip P.

The example of the 1st gestalt Suitable equipment for the immunological test based on [in drawing 5] a chemiluminescence method for this invention (system)

The example of ** 1 composition is shown.

This equipment consists of display 30 which displays the keyboard 31 and the information that various directions are inputted to the main frame 21 and the main frame which have the control unit 34 which controls each mechanism of equipment by the computer built in a processor and equipment.

the optical-measurement unit 28 which various containers are laid, and the main frame 21 is formed above the stage 32 movable to a cross direction, and this stage 32 to equipment, and is similarly prepared above the stage to equipment with the distributive-pouring unit 29 which can move in the direction of on either side, and the direction of up-and-down -- since -- it has become

As shown in drawing 6 , a predetermined interval is set, the nozzle N of 4 runs is arranged on the straight line, and the simultaneous drive of the nozzle N of these 4 runs is possible for the above-mentioned distributive-pouring unit 29. It can equip at the nose of cam of each nozzle N free [attachment and detachment of the pipet chip P], and cylinder 29a is prepared in the distributive-pouring unit 29 interior according to each nozzle N, piston 29b in each [these] cylinder 29a consists of 4 runs, and these pistons 29b performs suction of air, and discharging simultaneously.

In consideration of simplification and the cost cut, the piston in each cylinder is not giving the independence to a drive, and especially the distributive-pouring unit 29 used in this example of a gestalt is considering it as the composition which 4 run drives identically.

A cylinder and one are sufficient as the nozzle N of the above-mentioned distributive-pouring unit 29, or it may be separated. Even if it is this discrete type, highly precise control is attained by constituting a cylinder and a nozzle as a unit of a couple, shortening a hose as much as possible, and lessening an air gap as much as possible.

The pipet chip P with which the nozzle N of the distributive-pouring unit 29 is equipped has the pipet chip P used for the uptake of stirring, washing, and the magnetic-substance particle 2, and the chip used for distributive pouring of a reagent etc. Furthermore, there are an object for small capacity (mainly for immunity) and an object for large capacity (mainly DNA) in the pipet chip P. In this pipet chip P, although the bore of the liquid path 11 with isolation-region section 11a which arranges a magnet and carries out the uptake of the magnetic-substance particle 2 has obtained the good result using the about 2-3mm thing with this equipment, this bore should just be a size contained in the strong magnetism field which can carry out the uptake of the particle during passage of a solution.

This to which stirring before a uptake is performed on the occasion of the uptake of the magnetic-substance

particle 2 if needed is for making the precipitation state after an incubation mix. Moreover, this liquid makes the amount of suction at the time of a uptake the amount which applied the amount (air content of a liquid lower part) which can pass isolation-region section 11a of the pipet chip P at the volume in a container.
The speed in the case of a uptake and this are considering as 13microl/sec with this equipment, although liquid is the rate of flow which passes isolation-region section 11a of the pipet chip P, and the uptake of the magnetic-substance particle 2 is performed good by this rate of flow. Although it will become trustworthier [a uptake] if the rate of flow is simply slow, there is also balance with a throughput, and it judges synthetically, and is set as a suitable value. Moreover, this uptake speed changes with the kind of magnetic-substance particle 2, viscosity of a reagent, etc.
Drawing 7 and drawing 8 show the magnet driving gear suitable when processing liquid in the cylinder shown in drawing 6 and carrying out drive control of the source M of a magnetic field, and the pinching object V. in this example Because you support to revolve to the elevator style O free [opening and closing of the pinching object V which has the pinching sections V1, V2, V3, and V4 formed in the shape of a ctenidium] also for the source M of a magnetic field which has the magnet sections M1, M2, M3, and M4 formed in the shape of a ctenidium, and this and make it go up and down this elevator style O The rollers RA and RB of the elevator style O close, as shown in drawing 8 , the source M of a magnetic field and the pinching object V closed-operate in the chip pinching direction with the spring OS shown by drawing 7 , consequently the pipet chips P1, P2, P3, and P4 of these four books are received. It is constituted so that the source M of a magnetic field may be made to contact simultaneously or it can pinch simultaneously in the pinching object V and the source M of a magnetic field.
Thus, it is the case where the liquid processing line is formed by the septum with constituting the source M of a magnetic field, and the pinching object V, and without the source M of a magnetic field and the pinching object V colliding with a septum, adsorption of the magnetic-substance particle 2 in four liquid processing lines, churning mixture, or suction and regurgitation work of liquid can be simultaneously processed to the same timing, and processing efficiency can be sharply raised with easier composition. Of course, by this invention, it may be made to correspond to the needs instead of what is limited when forming the source M of a magnetic field, and the pinching object V with 4 run composition like the above-mentioned example of a gestalt, and you may form by two or more runs.
Furthermore, the function of a pressure sensor is prepared in the distributive-pouring unit 29 interior about the nozzle (for example, N1) of one of the nozzles N1, N2, N3, and N4 of 4 run. After this pressure sensor equips a nozzle N1 with the pipet chip P, it drops this pipet chip P and measures the position of the oil level in a container.
Although this can work separation, stirring, washing, etc. of a magnetic-substance particle simultaneously on the assumption that constant-rate preparation of the liquid of a reaction container is carried out beforehand It is necessary to pour a parent sample distributively as the previous work business. this parent sample Since it holds in the vacuum blood collecting pipe etc., the oil level has height and there is variation, when using the above-mentioned 4 run nozzle, it is preparing the oil-level detection function by the pressure sensor in one of them. One of them pours a parent sample distributively, and it is constituted so that simultaneous processing by four after parent sample distributive pouring can be made to serve a double purpose by the same distributive-pouring unit.
Therefore, in the case of distributive pouring of a parent sample, naturally it is nozzle N1 1 equipped with a pipet chip, and the position control of a pipet chip stocker and the pipet chip P is also needed in this case.
Of course, the base detection function of a container can also be prepared in the above-mentioned nozzle N1. If a nozzle N1 is dropped in submergence mode and the nose of cam of the pipet chip P hits a base, after equipping a nozzle N1 with the pipet chip P, since a nozzle N1 will carry out elasticity movement in back, this detects this.
Thus, if a base is recognized, after this, the nose of cam of a nozzle N1 will make it go up to the height which cannot touch a container, and will be made to perform suction and the regurgitation for the base of a container, and the nose of cam of the pipet chip P in point-blank range (0.1-0.2mm). According to this, the whole quantity can be attracted smoothly, without blocking the liquid containing the magnetic-substance

particle 2, and in case it is little distributive pouring, position control of the distance at the container base at the time of the regurgitation and the nose of cam of a pipet chip can be carried out very small.
Moreover, in case Nozzle N is equipped with the pipet chip P and it moves to it, in order to cope with liquid fall from the pipet chip P, the mechanism of the saucer of liquid fall is established. When this mechanism is adjoined and prepared in the distributive-pouring unit 29, this distributive-pouring unit 29 is raised and the point of the pipet chip P passes through the position of a saucer, you extrude this saucer, make it located under the pipet chip P, and the fall liquid from the pipet chip P is received.
The container tray 33 on which six cartridge containers 25 with which it became the chip rack 22 with which two or more trains arrangement of the pipet chip P with which the reagent container which has a rectangle-like aperture serves as the arranged reagent section 23 from four was carried out from four trains corresponding to the distributive-pouring unit 29 of 4 run, and two or more holes were established in each train have been arranged forward and backward is formed in the stage 32 shown in drawing 5 .
Furthermore, the measurement cell section 26 which holds the sample which finished the reaction container section 27 and processing in which the pipet chip place 24 kept possible [the aforementioned re-wearing] and two or more samples (this example 48 samples) were held in the container is formed in the stage 32.
the equipment for DNA or a virus, and bacteria also in immunity -- almost all reactions -- the constant temperature of predetermined temperature -- a state is needed In this equipment, temperature management put into practice by maintaining at predetermined temperature each reagent currently poured distributively beforehand, using the Peltier element as a heat panel, a heat block, or an object for cooling is performed.
Although an elevated temperature has comparatively much maintenance or processing to which the cycle of the predetermined temperature gradient is carried out especially as for DNA, with this equipment, liquid, a magnetic particle, etc. are only removed to the container beforehand set as predetermined temperature, and temperature management of liquid can be performed in it simple and with high precision.
The Peltier element is prepared in the reagent section 23 above-mentioned lower part, and heat insulation of the reagent is carried out to predetermined temperature. Moreover, the heat block is arranged under the container tray 33, and the liquid in the cartridge container 25 is maintained by predetermined temperature.
PMT (photomultiplier tube) as a measurement means which performs counting of the number of optical photons is prepared, this PMT of this carries out vertical movement, and the optical-measurement unit 28 shown in drawing 5 performs counting of the upper photon of sealing and cover. Of course, since a transmission-measurement method, spectrometry, nephelometry, etc. may be applied depending on a parameter, it is made to correspond to this and the measurement hole of the cartridge container 25 is formed transparently, and an optical measuring unit is made to correspond to a parameter, and is formed.
To the magnetic-particle solution which finished a series of reactions, since the luminescence time at the time of the CLIA method pouring in a trigger reagent (H2O2 grade) needs a trigger reagent (H2O2 grade) at the time of measurement for short **** and this reason, equipment of a trigger reagent distributive-pouring nozzle is needed.
On the other hand, the CLEIA method is a measuring method which the quantity of light is stabilized and does not need a trigger reagent from a plateau and a bird clapper at the time of after [a reaction] fixed time progress. The trigger reagent distributive-pouring nozzle was equipped in this equipment, and composition called a PMT+ trigger reagent distributive-pouring nozzle-holder + reaction cartridge was adopted, and this chose equipment of a trigger reagent distributive-pouring nozzle holder, and un-equipping, and it has perfect shading structure, and is considering as the structure where the CLIA method and the CLEIA method can be made to serve a double purpose.
Then, the fundamental control composition of the above-mentioned control unit 34 is explained.
CPU and memory 40 which perform various control concerning [this control unit 34] the main frame 21 as shown in drawing 9 , The display 41 which controls the display 30 which performs the various displays of a display of an analysis result etc., The worksheet read for example, with the optical mark-sensing vessel (OMR) as an item specification means to specify automatically the item which can perform a series of processings using the same cartridge container (although it is a kind of a mark sheet) Here, it is called a worksheet in the meaning which directs a work (work).
The automatic input control section 47 of the parameter which controls the input of the information by

wearing and communication of ******, and a floppy disk and CDROM, The care output section 42 which controls the keyboard 31 which performs an entry of data, and the pipet control section 43 which performs control of the distributive-pouring unit 29, the constant temperature of the stage control section 44 which controls a stage 32, and the heat block established under the above-mentioned container plate -- the constant temperature which performs control and heat insulation control of the Peltier element of the lower part of the reagent section 23 -- with a control section 45 It has the PMT control section 46 which controls PMT of the above-mentioned optical-measurement unit 28 etc.
Here, a part of aforementioned automatic input control section 47 and care output section 42 are equivalent to the aforementioned directions information input means.
Moreover, Above CPU and memory 40 receive the item specified through the parameter automatic input section 47 by the program. A processing pattern setting means 48 to set up a processing pattern based on the processing time or a cartridge container position of each process included in each item between the number of the washing process included in each item, the specified number of samples, the sample number of partitions, and the total time of each item, It has an analysis means 49 to analyze the result obtained through the above-mentioned PMT control section 46.
Furthermore, the program which shows the content of each item and the procedure which processes each item is beforehand stored in the aforementioned memory. Of course, in addition to this, the various control-command signals about the equipment concerned are memorized by Above CPU and memory 40.
The aforementioned processing pattern setting means 48 is shown in a view 10 in detail.
The content analysis section 482 of directions which analyzes the content of the worksheet read in the aforementioned automatic input section 47 as the processing pattern setting means 48 is shown in this drawing, The processing pattern determination section 483 which determines the processing pattern with which a distributive-pouring machine or a container concrete supply system should follow based on the analyzed content of directions, It has the SEQ control-lead section 481 which directs processing execution based on the determined processing pattern concerned to the aforementioned distributive-pouring machine or the aforementioned container concrete supply system.
The aforementioned content analysis section 482 of directions furthermore, from the read worksheet by for example, the number of samples and sample number-of-partitions judging section 48e The number of samples or the sample number of partitions is judged. by the content of processing, and the 48f of the number judging sections of reactions The aforementioned matter conditions, a reaction condition, or an operating condition is judged from the worksheet with which inspection request information was indicated, or a floppy disk or the thing by which keyboard entry was carried out, and it judges whether there are any directions of pretreatment or inside processing by pretreatment and 48g of inside processing directions judging sections.
Here, an initial complement is not beforehand prepared for each container for a reagent "pretreatment" and "inside processing" etc., but processing of the preparation stage which pours a complement distributively to a predetermined container about a required reagent etc. is said. With the gestalt of this operation, directions of pretreatment can be performed through the aforementioned automatic input control section 47.
It says that "pretreatment" makes these preparations before processing execution, and the processing to which "inside processing" pours a complement distributively to a predetermined container in the intervals of original processing about a required reagent etc. is said. With this gestalt, directions of the Nakamae processing or inside processing can be performed from the aforementioned automatic input section 47.
Moreover, sample SEQ control-lead means 48a which performs the directions which the aforementioned SEQ control-lead section 481 inhales a sample, and carry out the regurgitation to the specified container (accompanied also by required stirring) to a distributive-pouring machine, Adsorption SEQ control-lead means 48b which performs the directions to which the magnetic-substance particle combined with the quality of the specified substance which the magnet formed in the aforementioned distributive-pouring machine was made to approach a pipet chip, and has been suspended in the aforementioned liquid is made to stick inside a pipet, It has suction and 48d of whole-quantity SEQ system lung directions meanses which carry out the regurgitation for stirring SEQ control-lead means 48c which directs stirring, and all the liquid in a container by performing high-speed suction and regurgitation to a pipet chip.

It depends for a setup of a processing pattern on whether plurality, the singular number, and the sample number of partitions has the number of samples.
Although processing directed to the worksheet will be faithfully performed when the number of samples is the singular number, a processing pattern is determined that it will mention that the number of samples performs much processing at the time when the aforementioned processing pattern determination means 202 is for example possible the shortest based on directions of a worksheet when plurality or sample division is carried out, i.e., processing efficiency.
For that purpose, when the cartridge container concerned is stared in the aforementioned distributive-pouring position and it is made to concentrate on processing until it gets it blocked and the processing about one cartridge container completes the above-mentioned distributive-pouring unit 29 about one item, the processing time of all samples serves as the sum total of the number of processing-time x samples of each item, and the huge processing time is needed.
However, the great portion of processing time concerned is the time for an incubation (constant temperature reaction), and the distributive-pouring unit 29 is in the state of being vacant in the meantime. Then, the processing time can be shortened by making other processings perform using the time.
That is, the incubation time in one item of reaction process and its process is timing-diagram-ized, and is recognized, and while a distributive-pouring unit attaches time difference, it is efficiently controllable by performing them in parallel, using two or more reaction process managements as a processing pattern.
as conditions for enabling such control, the minimum incubation time tmin which can be set as the 1st is larger than sum total real ****** (time except the time of an incubation) T of the whole processing which consists of two or more reaction process -- namely, -- T<=tmin It is --** formula.
By this, one distributive-pouring nozzle can perform the same processing to quality of the specified substance, such as other one sample, at the time of an incubation.
incubation time t which the 2nd should set up is the integral multiple n of the minimum incubation time tmin concerned -- namely, -- t=nxtmin It is --** formula.
By this, one distributive-pouring nozzle can perform the same processing to other n samples at the time of the incubation concerned.
furthermore, when not only a distributive-pouring machine but control lead to a container concrete supply system is possible The point which there is not in the need of being able to use the same program and repeating read-out of a program if the same process is repeated in order to process efficiently, and can also stop operation of pipet equipment to the minimum movement is taken into consideration. The aforementioned item can be classified and increase in efficiency can be attained by transporting a container so that it may process collectively for every same item and every approximated item.
That is, about the same process of two or more same items in this case, if it is made to move to the following process after processing two or more cartridge containers and completing the processing concerned, while each cartridge container is performing the incubation, the distributive-pouring unit 29 can perform the same process processing, and is [container / cartridge / of the number / which can be processed to within a time / of the incubation] / efficient.
In consideration of the above point, the processing pattern setting means 48 concerning this example sets up a processing pattern.
thus, the most efficient processing pattern about the item the processing pattern setting means 48 was specified to be -- setting up -- the processing pattern concerned -- following -- the above-mentioned stage control section 44, the pipet control section 43, the PMT control section 46, and constant temperature -- control is directed to a control section 45
Moreover, in the pipet control section 43, it has the portion which controls movement in alignment with the portion which controls the drive of the aforementioned magnet, the portion which controls the drive of a pinching object, the portion which controls the drive of suction and the regurgitation, X and Y, and the Z-axis.
All operation of the distributive-pouring unit 29 in the main frame and stage 32 grade is managed by the control unit 34, and various processings are performed based on directions of a control unit 34. Each concrete content of processing is read through the parameter automatic input section 47, storage

preservation is carried out, and it is read to the file section 39 of a control unit 34 if needed, and is developed by the CPU memory 40.
Drawing 11 displays the various contents of control registered by the parameter form on screen 41a.
Here, among item 41b, the number of the item "HOLE" shows the hole position of the cartridge container 25, and shows the kind of reagent currently beforehand poured distributively by each hole to the column of "STEP." A magnetic-substance particle is expressed as "Fe" here, a penetrant remover is indicated to be "**" and indicator liquid is indicated to be "Co." Moreover, the amount of the reagent which should be poured distributively in each hole is registered into the line of "a reagent 1." Although the distributive-pouring unit 29 will pour distributively only the amount as which the reagent by which registration was carried out [above-mentioned] was specified in each hole of the cartridge container 25 when pretreatment mentioned above is directed, when pretreatment and inside processing are not directed, it will be poured distributively beforehand.
The amount of the sample which should be poured distributively by each hole is expressed to the line of a "sample."
Moreover, the number of times and stirring which were registered also about the "number of times of stirring" item are performed. This stirring attracts liquid in the pipet chip P from a container, and is further performed by the repeat which carries out the regurgitation of this to the container concerned.
Furthermore, suitable consideration is made in stirring. Namely, especially as for the liquid made into the object of stirring, to the part of a bottom, the matter of the shape of a solid-state and deep concentration has usually precipitated. Since the point of the pipet chip P is dropped to the position at the base of abbreviation of a container on the occasion of stirring and the phenomenon in which the quality of precipitate concentrates on a point with the detailed nose of cam of the pipet chip P, and plugs up a point will arise in this state if rapid suction is performed suddenly, it draws in at the speed which is a grade by which the above-mentioned concentration is eased at first and which was carried out slowly that this should be avoided.
Then, the quality of precipitate is attracted smoothly, and if **** is performed at the speed slowly made the same after suction of a complement, mixed distribution of the quality of precipitate will be carried out into liquid. Then, it can stir certainly and promptly by performing suction and **** at a quick speed.
In addition, the speed of suction and **** is separately registered as a speed of the stepping motor which makes a suction pump drive, and the speed of (+) and **** are registered for suction as a speed of (-) in that case.
Stirring is performed to the well from which the magnetic-substance particle 2 which adsorbed in the pipet chip P is desorbed in order to make it mix with the magnetic-substance particle 2 and a reagent completely, and the number of times of stirring is usually performed twice or more. The number of times of stirring is set as a suitable value according to the property of a reagent, and the kind of magnetic-substance particle 2.
In addition, it may perform making it secede from the magnetic-substance particle 2 using a penetrant remover, it also depends washing in this case on the repeat of suction and ****, and there are no operation and change of stirring substantially.
Although it is desirable to make it quicker than suction and **** speed at the time of separation work as for stirring (washing) speed in order to make the magnetic-substance particle 2 secede from the pipet chip P for a short time, if too quick, even if liquid will not follow (penetration of the liquid from the point of the pipet chip P does not fulfill a suction force) and it will pass slowly, the magnetic-substance particle 2 does not break away. Furthermore, **** (washing) speed is changed according to the viscosity of a reagent, or the kind of magnetic-substance particle 2. The usual stirring (washing) speed is usually performed by 300microl/sec grade as an amount of the liquid which passes through the inside of the pipet chip P.
If a "INC second" item specifies and puts the time of incubation in another way, the distributive-pouring unit 29 will serve as time which can process other cartridge containers 25 in the meantime.
With the form of this operation, since a reaction is performed twice so that clearly from the "INC second" being set as the 1st hole and the 3rd hole, it is judged by the aforementioned contents analysis section 482 of directions that it is equivalent to the 2 step method with two reactions.
When a flag 1 stands on the item of "adsorption owner 1 nothing 0", the last stirring operation is omitted

and the directions which perform a pan ping at high speed in the state where the magnet was made to approach a pipet chip are expressed.
Item 41c, i.e., the numeric value registered into each train of Sample SEQ, Adsorption SEQ, Stirring SEQ, and a "whole-quantity SEQ" item, is a sequence number, and processing will be performed in accordance with this turn. Therefore, the procedure of processing can be changed easily and it can respond to various inspection.
When two or more the cases or sample division of a sample are carried out, Items 41d and 41 e are needed. In this case, either Items 41d and 41 e or the item of the above "an INC second" is an item automatically determined by not the item that an operator sets up through an automatic input control section with a worksheet but the aforementioned processing pattern determination section based on simulation operation and the data registered beforehand of distributive-pouring machines, such as the number of samples, the sample number of partitions, the contents of processing, and the number of reactions.
Here in the time from the start of processing to a time [1st] incubation start, i.e., the example of drawing 11 Real ****** until Sample SEQ is completed, and real ****** of the process of "1" of drawing 11 are set to "A." Real ****** from the 1st incubation end to the time [2nd] following incubation start, Real ****** of the process of "2" - "6" of drawing 11 is set to "B", and real ****** from a time [2nd] incubation end to a processing end and real ****** of the process to "7" - "14" of drawing 11 are set to "C."
These sizes of A, B, and C can measure and decide on the time by operating a distributive-pouring machine in simulation.
Therefore, in this case, it can decide on the time tmin and t of an incubation using aforementioned formula **, A+B+C<=tmit and formula **, and t=nxtmin. Or an execute permission can judge whether it is no by specified t or tmin as a reaction process.
For example, if it decides on the time of an incubation as 373 seconds when real ****** of A obtains the measurement result of [****** / real / of B] 189 seconds in 101 seconds and real ****** of C for 83 seconds, in two or more samples or sample division, it can process efficiently.
Moreover, it points to the time of an incubation conversely and you may make it determine real ****** of A, B, and C from the time of the incubation concerned.
"SA", "SB", and "SC" furthermore, for reagent distributive pouring needed for "A", "B", and "C" which are set up by the aforementioned processing pattern determination section 483 when directions of inside processing are received in each process It is time required for distributive pouring of a reagent performed in the intervals of original processing, and is set up a little shorter than the time of the above "A", "B", and "C." Conversely, if it says, it will determine to set up the time of "A", "B", and "C" so that it may become a little longer than the time of the above "SA", "SB", and "SC" by the aforementioned processing pattern determination section 483.
Directions of pouring distributively two kinds of reagents "a reagent 1 and a reagent 2" in the same hole (HOLE), and building the mixed liquor of a reagent as other directions, for example, are also possible.
Moreover, it is also possible in the case of stirring and washing to specify the percent of the solution attracted from a container. For example, 80% of amount can be attracted and it can leave 20% of remaining amount to a container.
Bubble etc. arises, and since it is inconvenient, it is made for this to usually leave some liquid during stirring / washing, if air is attracted in a pipet chip.
Furthermore, in the case of a minute amount, the solution stirred and washed is very possible also for directing suction of air. Since the attracted liquid is a minute amount very much, the whole quantity of liquid is held by the attracted air at the isolation-region section of the pipet chip P, and this state is constituted so that it can stir by moving between predetermined [of the isolation-region section at the liquid path of the pipet chip P] up and down (repeat of suction and **** of a minute amount).
Furthermore, it can specify per suction of the liquid in the case of stirring, and speed of ****. For example, as for the polymeric material captured by the magnetic-substance particle 2, it is desirable for there to be some which are easy to separate with the property, and to **** in this case at a low speed, and low-speed specification is possible for it at this time.

Moreover, it can specify also about the number of times of suction and **** at the time of carrying out the uptake of the magnetic-substance particle 2 out of liquid. This number of times of a uptake is set as a suitable value by the strength of the property of the reagent contained in the liquid at the time of a uptake, and the magnetization nature of the magnetic-substance particle 2 etc. But the uptake of the magnetic-substance particle 2 is fully possible by the few number of times of a uptake from supposing that the uptake of the magnetic-substance particle 2 is performed in the narrow portion (liquid path 11) of the pipet chip P in this equipment. Usually, this number of times of a uptake specifies 1 - 2 times.
By the way, although there is also a method of unifying the amount of a parent sample into a constant rate, and processing it in pretreatment of this kind etc., since this equipment processes four samples of a lot simultaneously, the difference in the amount of a parent sample, i.e., the difference in oil-level height, poses a problem.
When the amount of the above-mentioned parent sample is inharmonious, and equipment grasps the amount of a parent sample in advance of processing, the descent position of the proper distributive-pouring unit 29 can be judged [in the case of distributive pouring etc.].
The case where four samples are inspected simultaneously is made into an example about measurement of an oil level, and the case where the distributive-pouring machine with which Nozzle N was respectively equipped with the pipet chip P of 4 run is used is explained. The pressure sensor is prepared in one nozzle N in the nozzle N of the 4 aforementioned run.
The pipet chip P with which the nozzle N in which the pressure sensor was prepared was equipped is inserted in the container with which the 1st sample is contained at first, the desorption of the pipet chip P which it detected and measured and was equipped with the oil level is carried out, and it is kept in the storage section. Next, equipping with the pipet chip P for another samples the nozzle N concerned in which the pressure sensor was prepared, inserting in the container with which the 2nd following sample is contained, and measuring the oil level concerned, it pours distributively so that it may become the same height as the oil level of the 1st sample of the above. Since the oil level of four samples can be arranged by repeating these operation about four samples, a processing process can be advanced simultaneously 4 sample.
If the nose of cam of the pipet chip P enters deeply in liquid in case liquid is poured distributively, or in case a reagent is poured distributively, liquid will be attached to the outer wall of the pipet chip P in large quantities, and fixed quantity precision will be influenced. In order to cope with this, it processes with the above-mentioned liquid level sensor, always recognizing an oil level.
Moreover, it can use for measurement of the amount of the reagent in the reagent container laid in the above-mentioned reagent section 23 as other use of the above-mentioned pressure sensor. Although the reagent of a complement is beforehand prepared for these reagent container and processing is performed using this, when the amount of a reagent is inadequate, processing being interrupted and causing trouble is expected enough. in order to prevent this -- processing -- preceding -- a reagent -- required ** -- a certain ** is measured, and when inadequate, the disposal of warning etc. can be demanded from a deed operator to supply of a reagent
Furthermore, the above-mentioned liquid level sensor can detect TSUMARI in the case of suction. Although the load concerning suction in case this detects the usual oil level is small, when this load is more than predetermined, it is judged that suction difficulty, i.e., TSUMARI, arose. Such TSUMARI is generated when the viscosity of the sample itself is high. When a liquid level sensor detects above-mentioned TSUMARI, a control unit 34 emits a predetermined warning on a screen etc., an operator is told about it and the disposal of removal of the corresponding sample etc. is urged to it.
Next, according to the content of directions concerned shown in the view 12, processing is explained about the case where immunochemistry inspection by the chemiluminescence method is conducted concretely. This processing process is performed according to directions of a control unit 34 based on procedure, time, etc. by which registration was carried out [above-mentioned].
The content corresponding to the processing shown in the view 11 is indicated to a worksheet, and it directs through the aforementioned automatic input section 47.
Then, from a worksheet, the aforementioned content analysis section 482 of directions has even Step S1 -

Step S12 as that there are two or more numbers of samples, and a content of processing, and judges and analyzes the existence of the content of each process, the kind of reagent, an amount, a position, the amount of a sample, a position, the time of an incubation, the existence of adsorption, the number of times of stirring, the number of reactions, pretreatment, and inside processing etc.
Here, the number of Step S1 - Step S12 is in agreement with the number which shows the sequence of each process of a view 11.
In advance of processing, the reaction insoluble magnetic-substance liquid of requirements, the penetrant remover of requirements, and the indicator liquid 6 of requirements shall be beforehand held in the predetermined hole of the cartridge container 25, and further, these gestalten shall be consisted of by the hole for measurement of the measurement cell section 26 so that substrate liquid 7 may be poured distributively and a luminescence state may be measured. Therefore, a setup of pretreatment or inside processing shall not be carried out.
Then, based on the aforementioned analysis result, the processing pattern determination section 483 sets up real ****** A, B, and C, and determines and directs a processing pattern to the aforementioned SEQ control-lead section 481.
If processing is started, at Step S1, sample SEQ program 48a will be started and a control unit 34 will move the distributive-pouring unit 29 and a stage 32 to the position of the chip rack 22. And descend the distributive-pouring unit 29, the nozzle N of 4 run is made to equip with the pipet chip P, and the reagent of the specified quantity is attracted from the reagent section 23 using these pipets chip P, and it transports to the position of the cartridge container 25, and pours distributively.
This transfer is performed by movement of the cross direction to the equipment of a stage 32, and the transfer of the longitudinal direction of the distributive-pouring unit 29. As for the distributive-pouring unit 29, the nozzle N of 4 runs operates in concurrency.
And by movement of the distributive-pouring unit 29 and/or a stage 32, using the proper pipet chip P, the 1st sample of an initial complement is attracted from the predetermined specimen container of the specimen container section 27, and this is rough-poured distributively in the predetermined hole of the cartridge container 25.
Next, specified quantity suction of the sample rough-poured distributively is carried out with the above-mentioned pipet chip P, and a fixed quantity is performed. The pipet chip P with which the sample rough-poured distributively was attracted is transported, after it carries out the whole-quantity regurgitation of the sample attracted by the reaction insoluble magnetic-substance liquid in the 1st hole (hole), it repeats the mixed liquor of this sample and the above-mentioned reaction insoluble magnetic-substance liquid with the above-mentioned pipet chip P, is suction - Made to breathe it out (pan ping), and generates the uniform stirring mixed state of the magnetic-substance particle 2.
If processing of the cartridge container 25 (four samples) of 1 reaches a predetermined stage, using the time of the incubation about the 1st sample of step S1a, the distributive-pouring unit 29 and a stage 32 will be moved, it will move to the processing about the cartridge container 25 of other groups in which the 2nd is sample 5, and processing of the same process will be performed. Thus, processing of each class is performed so that the time of the distributive-pouring unit 29 may not overlap.
Drawing 13 (a) shows the timing diagram of processing of two or more samples of the 2 step method (processing to which two reactions are carried out), and between A and B of the 1st sample is equivalent to the time interval of the 1st incubation. The case where processing of A of the 2nd sample is made in the meantime is shown.
The mixed liquor currently held at Step S2 at the cartridge container 25 with which it moved to processing of the 1st sample of the first group concerned at the time of the 1st incubation after the processing end of A of the 2nd sample, the stirring SEQ program was started, the distributive-pouring unit 29 equipped with the pipet chip P from the chip rack 22, and the incubation was carried out [above-mentioned] is stirred by repeating suction and the regurgitation at high speed with the above-mentioned pipet chip P.
After stirring, at Step S3, an adsorption SEQ program is started and the uptake of the magnetic-substance particle 2 is performed. On the occasion of a uptake, the magnet M which adsorbs the reaction insoluble magnetic substance is moved to the peripheral face of the liquid path 11 of the pipet chip P possible [

attachment and detachment] according to the magnetic mechanism shown in above-mentioned drawing 5 .
When passing isolation-region section 11a of the pipet chip P, the uptake of the magnetic-substance particle 2 which floats in the mixed liquor attracted at a low speed by the pipet chip P at this time is carried out to the internal surface of the above-mentioned liquid path 11 by the magnetism of the magnet M arranged in the outside of this pipet chip P. Moreover, the suction height of the mixed 20 above-mentioned liquid is attracted by the above-mentioned pipet chip P, and when all mixed liquor is attracted, it is considered so that the uptake of the magnetic-substance particle 2 may be carried out completely so that the inferior surface of tongue may serve as the same level as the soffit of Magnet M.
Thus, after the uptake of the magnetic-substance particle 2 is carried out, the effluent of the mixed liquor except this magnetic-substance particle 2 is breathed out and carried out to the 1st hole of the cartridge container 25, and only the magnetic-substance particle 2 remains in the above-mentioned pipet chip P.
By step S3a, the above-mentioned pipet chip P is sent to the 2nd next hole, with the uptake of the magnetic-substance particle 2 carried out.
However, since the flag 1 stands on the item of "adsorption owner 1 nothing 0" as shown in drawing 11 , at Step S4, stirring process is skipped and it progresses to Step S5.
At Step S5, a penetrant remover is attracted from the 2nd hole. At this time, the above-mentioned magnet M is in the state close to the outside side of the liquid path 11 with isolation-region section 11a of the pipet chip P, and all the magnetic-substance particles 2 can be efficiently washed by being high speed and carrying out the multiple-times pan ping of the penetrant remover.
And after the above-mentioned panping is completed, the above-mentioned pipet chip P carries out constant-rate suction of the penetrant remover in a hole slowly. At this time, again, the uptake of the magnetic-substance particle 2 which floats in the penetrant remover which approached the pipet chip P and was attracted is carried out altogether, the penetrant remover except this magnetic-substance particle 2 is breathed out by the above-mentioned hole, and, as for the above-mentioned magnet M, only the magnetic-substance particle 2 remains in the above-mentioned pipet chip P.
By step S5a, the above-mentioned pipet chip P is sent to the 3rd next hole, with the uptake of the magnetic-substance particle 2 carried out. Then, at Step S6, indicator liquid is attracted from the 3rd hole. The reaction of all the magnetic-substance particles 2 and indicator liquid 6 can be made to equalize by the above-mentioned magnet M moving in the direction which separates from the pipet chip P, and canceling the adsorbed state of the magnetic-substance particle 2, therefore carrying out the pan ping of this indicator liquid 6 at this time.
And the 2nd incubation of the 1st sample is started.
In order to process A about the 3rd sample as are shown in drawing 13 (a), and mentioned above if the 2nd incubation is started, another cassette container or the distributive-pouring unit 29 is moved.
And if it will move to processing of B of the 2nd sample, and the processing concerned will be completed, if the above-mentioned panping is completed and the 1st incubation of the 3rd sample starts, and the 2nd incubation is started about the 2nd sample, it will move from the distributive-pouring unit 29 to processing of C of the 1st sample.
At Step S7, the above-mentioned pipet chip P carries out constant-rate suction of the indicator liquid 6 in a hole. At this time, again, the uptake of the magnetic-substance particle 2 which floats in the indicator liquid 6 which approached the pipet chip P and was attracted is carried out altogether, the indicator liquid 6 except this magnetic-substance particle 2 is breathed out by the above-mentioned hole, and, as for the above-mentioned magnet M, only the magnetic-substance particle 2 remains in the above-mentioned pipet chip P.
By step S7a, the above-mentioned pipet chip P is sent to the 4th next hole, with the uptake of the magnetic-substance particle 2 carried out, after being Step S8 and Step S9, attracting the penetrant remover in this hole and the same procedure as the above performing washing and the uptake of the magnetic-substance particle 2, the penetrant remover of the next hole is attracted in the same procedure as the above-mentioned penetrant remover suction procedure, and washing and the uptake of the magnetic-substance particle 2 are performed.
By step S9a, with the uptake of the washed magnetic-substance particle 2 carried out, the above-mentioned

pipet chip P is sent to the 5th next hole, is Step S10 and attracts the substrate liquid 7 in this hole. The reaction of all the magnetic-substance particles 2 and substrate liquid 7 can be made to equalize by performing the pan ping which the above-mentioned magnet M moves in the direction which separates from the pipet chip P, and cancels the adsorbed state of the magnetic-substance particle 2, therefore repeats high-speed inhalation and **** for this substrate liquid 7 at this time.
And at Step S11, the whole quantity containing substrate liquid 7 is inhaled, by step S11a, move the whole quantity to the 10th hole, the whole quantity is made to breathe out at Step S12, and processing is ended.
And after the above-mentioned panping is completed, again, the aforementioned pipet chip P is transported to the pipet chip place 24, and is held.
After the above processing is completed about the 1st sample, according to a view 13 (a), processing of A of the 4th sample will be started and the same processing will be repeated.
The processed liquid is moved to the measurement cell of the measurement cell section 26. And a stage 32 is moved after fixed time progress, and the corresponding measurement cell is sent to the measuring point of the optical-measurement unit 28.
By this measuring point, this amount of luminescence is measured with the optical measuring unit which consists of composition corresponding to predetermined measuring methods, such as PMT, and ends a series of processings.
On the other hand, according to the time SA, SB, and SC of reagent distributive pouring of the aforementioned screen 41a, when there are directions of inside processing, the aforementioned processing pattern determination section 483 determines a processing pattern, and directs the aforementioned SEQ control-lead section 481 to the aforementioned distributive-pouring unit and a container concrete supply system so that reagent distributive pouring may be carried out in the intervals of [interval] original processing.
While this prevents dryness of the reagent at the time of being poured distributively beforehand, contamination, and deterioration, efficient and reliable processing can be performed by pouring distributively just before [required for processing].
In addition, in the form of this operation, although the distributive-pouring unit 29 of 4 run was used, of course, this may not be restricted to 4 runs, 8 run or more than it is sufficient as it, and even if it is 1 run, processing shall be the same, and the number of these runs should embrace the scale of equipment.
The example of the 2nd form As the equipment concerning this example of a form is shown in drawing 14 , the distributive-pouring unit 66 which moves to the rotation stage 67 to which the cartridge container 63 with which it was loaded is transported to a predetermined position by instructions, and the upper part of this rotation stage 67** in the diameter direction of a stage, equips with the pipet chip P, and does various work, and PMT move up and down, and the optical-measurement unit 65 which performs counting of the upper photon of sealing
To the above-mentioned distributive-pouring unit 66, the magnet desorption control unit to the pipet chip P is prepared in one, and has the distributive-pouring unit 66 which consists of 4 runs which can perform washing of B/F separation (antigen antibody combination and isolation type), stirring by the pan ping (perform repeat suction and ****), and a magnetic-substance particle.
Moreover, the nozzle of the distributive-pouring unit 66 is equipped and the chip rack 62 currently laid where the intact pipet chip P which does distributive-pouring work etc. is stood, and the abandonment section 61 which discards the used pipet chip P are formed.
The above-mentioned rotation stage 67 carries out the rotation transfer of two or more cartridge containers 63 with which the radial was loaded by instructions.
As shown in drawing 15 , the cartridge container 63 concerning this example of a form has the base 51 formed with the transparent bodies, such as glass and plastics, and eight holes are established in this base 51.
The hole located at one edge among the eight holes concerned is the hole 53 for measurement for optical measurements. The array and number of each [these] holes make a reaction step correspond, can be chosen suitably and can be formed. Moreover, the bottom of other seven holes 52 is formed in the shape of cross-section abbreviation for V characters, and a streak of slot 54 of a cross-section abbreviation concave

is formed in the inner bottom of each bottom 56 along the inclined plane of an inner bottom.
Since the width-of-face size is smaller than the aperture size of the point of the pipet chip P and this slot 54 is formed, even if the point of the pipet chip P contacts an inner pars basilaris ossis occipitalis, the sample held in the hole 52 can flow and carry out whole-quantity suction of this slot 54, and can guarantee fixed quantity nature.
Moreover, the cartridge container 63 is arranged by four-piece parallel towards the direction of a center of the rotation stage 67, and it is equipped with it so that the hole 53 for measurement may have consistency with the position of the optical-measurement unit 65.
Thus, since the position of the optical-measurement unit 65 is eternal seen from the hole 53 for measurement by arranging the cartridge container 67, the optical-measurement unit 65 does not have the need for movement. It will be made the list which met arrangement of the cartridge container 63 also about each nozzle of the distributive-pouring unit 66 of the 4 above-mentioned run. In addition, how to arrange the cartridge container 63 on the same line (for it to correspond to the tangent of a rotation stage) altogether is also considered, and in this case, it is necessary to constitute the position of the optical-measurement unit 65 so that it may be made to move to two positions of the position of the hole 53 for measurement of two cartridge containers 63 of a central site, and the position of two outside holes 53 for measurement.
This equipment is set to the cartridge container 32 of four lots where a reagent, a penetrant remover, and a sample are poured distributively beforehand, and processing is started. In addition, although the fundamental processing process of equipment is the same as that of the above-mentioned example of the 1st form, in moving from processing of a lot to processing of other groups, it differs in respect of **, such as rotating the rotation stage 30.
The example of the 3rd form Drawing 16 shows the main frame 79, a control unit is built in by this like the above-mentioned example of the 1st form, to this control unit, various directions are inputted from a keyboard (not shown), and required information is displayed on display (not shown) again.
Various containers are laid, and the main frame 79 is formed above the stage 80 movable to a cross direction, and this stage 80 to equipment, and has the distributive-pouring unit 78 which can move in the direction of on either side, and the direction of up-and-down to equipment. In addition, therefore the optical-measurement unit (PMT) does not prepare for this main frame 79, it is performed to it using the equipment only for measurement etc. about measurement.
Since the composition of the above-mentioned distributive-pouring unit 78 etc. is the same as that of the form of the above-mentioned implementation, it omits explanation here.
The specimen container section 74 which holds the sample corresponding to each train of the container plate 81 with which the reagent section 72 by which two or more reagent containers which have a rectangle-like aperture have been arranged, and the cartridge container 75 with which it consisted of lot 4 train, and two or more holes were established in each train have been arranged 6 sets and the chip rack 71, the chip rack 73 for amplification, and the cartridge container 75 is formed in the above-mentioned stage 80.
Moreover, the ** tone containers 76 and 77 are formed in the stage 80. Two or more container holes for liquid hold are established in the upper surface of this ** tone container 76, the heat block or the heat panel is arranged inside the ** tone container 76, and an upper container hole can be maintained to the temperature loaded condition of constant temperature (for example, 60 degrees C). The Peltier element which has a heat-absorptive operation is arranged, and it is used for the interior of other ** tone containers 77 as a heat insulation container.
a heat block prepares also under the container plate 81 -- having -- **** -- the upper cartridge container 75 -- fixed constant temperature -- it is maintainable in the state Since the ** tone container 77 is formed, temperature management can be easily performed to this equipment, and it can respond to it promptly also to two or more temperature conditions. In addition, the fundamental processing process of equipment is the same as that of the example of a form of the above 1st.
The example of the 4th form The control unit is built in by drawing 17 like the above-mentioned example of the 1st form, and various directions are inputted from the touch keyboard formed in the monitor section 98 to this control unit, and the liquid crystal display of the information is carried out to the monitor section

98.
Various containers are laid, it is prepared above the stage 90 movable to a cross direction, and this stage 90 to equipment, and the main frame 99 is the distributive-pouring unit 97 which can move in the direction of on either side, and the direction of up-and-down, and an optical-measurement unit (PMT) to equipment. It has 96.
Since it is the same as that of the gestalt of the 1st operation about the above-mentioned distributive-pouring unit 97 and the optical-measurement unit 96, explanation is omitted here.
The container plate 92 and the container hold box 95 with which the cartridge container 91 with which it consisted of lot 4 train, and two or more holes were established in each train has been arranged 4 sets are arranged on the above-mentioned stage 90.
Beforehand, a required reagent, a required penetrant remover, etc. are poured distributively by each hole of the above-mentioned cartridge container 91, and the sample is poured distributively in the sample hole. This cartridge container 91 is carried where sealing of the whole is carried out, and if it sets in this equipment as it is, it can start processing immediately.
As shown in drawing 18 , the whole consists of a product made of paper, the mould of the upper surface of the container hold box 95 is carried out, the chip hold section 93 which holds the pipet chip P is formed in the part of an abbreviation half on top, the measurement container section 94 is formed in other parts, two or more holes in which measurement liquid is held are prepared here, and the above-mentioned container hold box 95 can equip each hole with cap 95b. Furthermore, the diaphragm was formed in the interior of this container box, and pipet chip P is isolated with the diaphragm. Since after use is discarded, this container box is easy to manage, and can put lid 95c on the upper part, and makes conveyance and storage easy.
The example of the 5th form Based on drawing 19 or drawing 22 , the fundamental control system of the equipment 100 concerning this example of a form is explained.
The control system of the equipment concerning this example of a form controls liquid distributive pouring, a reaction, an incubation, stirring, washing, and measurement.
As shown in drawing 19 or drawing 21 , the equipment 100 concerning this example of a form CPU and memory 140 which perform various control about the equipment 100 concerned, The display 141 which performs the various displays of directions of charge of the cartridge container 151, a display of an analysis result, etc., It is equivalent to the aforementioned cartridge container information reading means, and has the bar code reading control section 166 which reads and decodes the bar code given to the edge of the direction near the center of the rotation stage 131 of the cartridge container 151 with which the aforementioned rotation stage 131 was loaded by the bar code read station 115.
Furthermore, by the optical mark-sensing section (OMR) equivalent to an item specification means to specify the item which can perform a series of processings using the same cartridge container, the floppy disk, CDROM, communication, etc. The automatic input control section 147 which controls the automatic input of sample item information, and the I/O section 142 which has printer equipment which inputs the information concerned etc. with a keyboard, a mouse, etc., and performs the record output of data, The pipet device control section 143 which controls pipet equipment, and the rotation stage control section 144 which performs control of the rotation stage 131, the constant temperature of the heater which is the thermostat prepared in the stationary plate 154 of the aforementioned rotation stage 131 -- the constant temperature which controls -- it has a control section 145 and the PMT control section 146 which performs control of Above PMT In addition, the sign 172 shows the pipet control section by which a sign 173 controls the operation of a pipet for the XYZ stage control section which controls movement of the XYZ direction of a distributive-pouring unit among drawing 22 .
Moreover, the item specified to be Above CPU and memory 140 through the inspection-item ****** input section 147 by the program is received. A processing pattern setting means 148 to set up the processing pattern of each process based on the processing time or the cartridge container position of each process included in the number of the washing process included in each item, each specified number of items, the processing time of each item, or each item, The charge directions means 170 to which charge on the aforementioned rotation stage 131 is urged about the cartridge container which corresponds among the

cartridge containers 151 which attached the information about the cartridge container 151 containing the corresponding identification information of an item, The analysis means 149 and ** which analyze the result obtained through the aforementioned PMT control section 146 are constituted.
Furthermore, the program which shows the content of each item and the procedure which processes each item is beforehand stored in the aforementioned memory. Of course, in addition to this, the various control-command signals about the equipment concerned are memorized by Above CPU and memory 140.
Then, if operation of this example of a gestalt is explained, an operator will make it the mark of form which can read the aforementioned optical mark reader which is equivalent to the aforementioned item specification means in the item showing the processing which it is going to inspect for example, into the aforementioned mark sheet, and will write in a mark sheet.
In addition, a patient's registration number etc. is written in the mark sheet by the mark. This is read by the optical mark reader concerned. It is carried out to a mark sheet attaching a mark to the item which corresponds among the items showing the processing considered as inspection use, by attaching the corresponding number of items to a mark, etc. Control of reading is controlled by the aforementioned automatic input control section 147. It is directed that the charge directions means 170 constituted by Above CPU and memory 140 loads the aforementioned rotation stage 131 with the cartridge container 151 corresponding to the specified item. The directions concerned are performed by displaying the total number of each item in the cartridge container 151 with which the screen of the aforementioned display 141 should be loaded.
based on the screen concerned, the cartridge container 151 of the item which corresponds one [at a time] from the insertion mouth 110 of the aforementioned rotation stage 131 was directed to the operator -- it loads the number every
Thus, the aforementioned rotation stage 131 is loaded with the cartridge container corresponding to each item at random.
Thus, if charge on the aforementioned rotation stage 131 of the required cartridge container 151 is completed, with Above CPU and directions of memory 140, the rotation stage 131 concerned will be rotated one time, and the aforementioned bar code read station 115 will read the bar code given to the edge near the center of each cartridge container 151.
By this, Above CPU and the processing pattern setting means 148 of memory 140 recognize the quantity of each item, and a position based on the bar code given to each read cartridge container 151.
Based on the recognition result, the processing pattern showing the sequence that each item should be processed is set up as follows.
A setup of a processing pattern is performed so that it may raise that a setup of a processing pattern performs much processing at the shortest possible time, i.e., processing efficiency. And if it can do in that case, it will be, lessening operation of the rotation stage 131 if possible.
For that purpose, when the cartridge container concerned is stared in the aforementioned distributive-pouring position and it is made to concentrate on processing until it gets it blocked and the processing about one cartridge container completes the aforementioned pipet equipment about one item, the processing time of all items serves as the number of processing-time x items of each item, and the huge processing time is needed.
However, the great portion of processing time concerned is the time for an incubation (constant temperature reaction), as mentioned above, and the pipet chip P is in the state of being vacant in the meantime. Then, the processing time can be shortened by making other processings perform using the time.
If the same process is repeated as the aforementioned example of a gestalt described to it, the same program can be used, it is not necessary to repeat read-out of a program and, and operation of a pipet chip can also be stopped to the minimum movement.
Therefore, the aforementioned item is classified also according to this example of a gestalt, and it processes collectively for every same item and every approximated item in it.
Then, about the same process of two or more same items, if it is made to move to the following process after processing two or more cartridge containers and completing the processing concerned, while each cartridge container is performing the incubation, a pipet chip can perform the same process processing and

is [container / cartridge / of the number / which can be processed to within a time / of the incubation] / efficient.
this invention uses effectively the non-processing time Iji of pipet chips, such as an incubation of the process i of a certain item j, i.e., time to need the non-processing state of the pipet chip which cannot perform succeedingly the next processing to the same cartridge container by the pipet chip.
The number nji of the cartridge container which a pipet chip can otherwise process in the aforementioned non-processing time Iji now The maximum time of processings, such as distributive pouring by the pipet chip itself, is set to P (if compared with the time of the aforementioned incubation, it will be very short time). under the aforementioned non-processing-time Iji progress -- the above -- it controls so that the following relational expression is realized at the sum total time Rji needed for a transfer until the same cartridge container is transported and it returns to a distributive-pouring position again
namely, formula Pxnj i+Rj i <=Ij i it is .
Therefore, the item of the nji individual defined from the formula concerned can be processed in parallel at least (own processing is also included). If a transfer of a cartridge container is performed by rotating the aforementioned rotation stage 131 to the forward direction in that case, the time of Above Rji can be shortened more.
In performing a series of processings continuously separately for every cartridge, the non-processing time of the aforementioned pipet chip cannot be used, but the huge time about sigmaijnji-Iji (the sum is taken about i and j) is needed for every cartridge container.
In consideration of the above point, the processing pattern setting means 148 concerning this example of a gestalt sets up a processing pattern as follows.
First, the data which express the content of each item beforehand stored in memory about the set-up item are read.
Next, the number of the washing process included in the process of each item is detected.
Each item is classified according to the number of washing process. A difference of the number of washing process defines fundamentally the procedure of processing of each item, such as a difference of the number of times of distributive pouring, and a difference of the processing time, performed by each item.
Processing approximates the items with the same number of washing process mutually.
Each item divided by the number of washing process is classified for every item, and the number of each of that item is investigated.
Next, the process (time) of the incubation of each item is investigated, it classifies in time of an incubation, and a processing pattern is set up.
For example, A, and D and E have washing process in the item of one step, B and C have washing process in the item of two steps, and washing process presupposes that F and G are in the item of three steps.
Here, a difference of the item within each step originates in a difference of the kind of the reagent to be used or indicator medicine etc.
Furthermore, to each step, it classifies for every item and the number of items is investigated. For example, at one step, it considers [Item / A / Item / 15 samples and / D] as 14 samples about 11 samples and Item E.

Moreover, if it classifies according to the time of the incubation of each aforementioned item, i.e., the time which item processing takes, supposing 32 minutes and Item E are the processing times for 20 minutes, since Item A and Item E are 20 minutes, Item D will classify into the same group, and since Item A is 32 minutes, it will classify Item D into another group for 20 minutes, for example.
Since it may be necessary to perform processing which changed the incubation even if it is the same number of washing process and is the case where the same indicator medicine etc. is used, the difference of this processing time is produced.
When the number of washing process is 1 in that case, while the rotation stage 131 rotates one time from nji defined from the aforementioned formula, five cartridge containers / when the number of washing process is 2, 30 minutes presupposes that it is possible, and 30 minutes is made possible, and four cartridge containers / when the number of washing process is 3, three cartridge containers / 30 minutes, then the case of being efficient are explained.

In this case, when the number of washing process is 1, the aforementioned processing pattern setting means 148 performs every 5 processing [3 times] first about the aforementioned item A, next performs-five two-times processing at a time about E, and is completed. Next, it sets up so that every 5 processing [2 times] may be performed about Item D.
Then, four samples remain about Item E and one sample remains about Item D.
It sets up so that similarly processing in case the number of washing process is next 2 may be performed and processing in case the number of washing process is 3 further may be performed.
after the above batch processing is completed, it sets up so that it may process in each washing process by resembling four samples of Item E, and one sample of Item D, and being engaged in processing of the item which remained, for example, the case of the washing process 1
thus, the most efficient processing pattern about the item the processing pattern setting means 148 was specified to be -- setting up -- the processing pattern concerned -- following -- the aforementioned rotation stage control section 144, the pipet chip control section 143, the PMT control section 146, and constant temperature -- pointing to control to a control section 145, this equipment 100 does each aforementioned work of separation, stirring, and washing efficiently according to these directions
Availability on industry As a suitable application field of this invention constituted in this way Are effective in what is set as the objects, such as physical / chemical adsorption to the matter and the magnetic substance which exist in the reaction or liquid generated between the liquid which does not contain the magnetic substance and the magnetic substance. for example, as this matter immunological matter and biological matter, such as an antigen, an antibody, protein, an enzyme, DNA, Vectors DNA and RNA, m-RNA, or a plasmid, or the molecule study-matter -- or It is applicable to the detection method or clinical test equipment for the marker used for an isotope required for its quality and fixed quantity, an enzyme, a chemiluminescence, firefly luminescence, an electrogenerated chemiluminesence, etc. And specifically, it is applicable to an immunological test, chemical reaction inspection, extraction and recovery / isolation equipment of DNA, etc.
For example, when this invention is applied to immunochemistry test equipment, it is desirable to constitute so that it may transport, while a specimen container is formed in a cartridge container with two or more liquid stowages, a required sample and a required reagent are beforehand poured distributively to each liquid stowage on a reaction or processing and the magnetic substance had been made to stick to the medial surface of the liquid path of a pipet chip by magnetic magnetism. In this case, the liquid poured distributively is beforehand poured distributively to the liquid stowage as mentioned above, or a part is sufficient as it and it may be gradually poured distributively by down stream processing. Moreover, for example, from a parent specimen container, the direct fixed quantity of the sample can be carried out, and it can also be poured distributively. In addition, the singular number is sufficient as the quantity of the liquid stowage of a cartridge container, or it may be formed in the shape of [of two or more trains] a microplate. When formed in the shape of [this] a microplate, by making it correspond to a liquid stowage train, and arranging,-izing also of the distributive-pouring unit can be carried out [multichannel], and it can raise a throughput sharply.
[1996 year 10 month 28 day (28.10.96) international secretariat acceptance: The claim 1-30 of the time of application was transposed to the new claim 1-36. (9 pages)]
Claim 1. In case the liquid which made this isolation-region section of the pipet section which has the isolation-region section by which a magnetic field operation is done in the liquid path which connects a point and a reservoir, and carries out suction of liquid or the regurgitation suspend a magnetic-substance particle is passed By exerting a magnetic field operation on the aforementioned isolation-region section from the lateral surface of a liquid path, and making a magnetic-substance particle stick to the medial surface of a liquid path The kind are the control method including the process which makes a magnetic-substance particle separable from liquid, and concerning matter, such as quality of the specified substance, such as a sample, and a magnetic-substance particle Reaction conditions, such as time of matter conditions, such as quantity or a hold position, the number of reactions, and an incubation, or temperature, Or the directions information containing operating conditions, such as existence of adsorption by the existence, the position, the time, the sequence, the number of times, the speed, or the magnetic field of the

suction and the regurgitation by the distributive-pouring machine, is inputted (S100). Based on the inputted aforementioned directions information or the registered information, the content of directions required for processing execution is analyzed (S101). Based on the analyzed content of directions, the processing pattern with which a distributive-pouring machine or a container concrete supply system should follow is determined (S102). The control method of the magnetic-substance particle by the distributive-pouring machine characterized by what processing execution is directed for to the aforementioned distributive-pouring machine or a container concrete supply system based on the determined processing pattern concerned (S103).
2. Suction and the regurgitation speed of the liquid attracted and breathed out by pipet circles when the magnetic field operation is exerted for the purpose of separation of a magnetic-substance particle on the aforementioned isolation-region section of the pipet section is the control method of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 1 characterized by to be set as a late speed which is a grade from which sufficient effect for the separation purpose is acquired.

3. Control method of magnetic-substance particle by distributive-pouring machine indicated by claim 1 characterized by controlling to carry out uptake of magnetic-substance particle in process which carries out whole-quantity suction and carries out regurgitation of sample of constant rate where magnetic-substance particle suspension of constant rate is mixed, or 2.
4. Control method of magnetic-substance particle by distributive-pouring machine indicated by claim 1 characterized by carrying out drive control so that inferior surface of tongue of attracted liquid may be raised in position more than soffit region of the aforementioned isolation-region section, when whole-quantity suction of liquid is carried out, or either of 3.
5. Control method of magnetic-substance particle by distributive-pouring machine which attracted liquid at high speed and was indicated by claim 1 characterized by controlling to perform the soffit section of the pipet section in state where you made it surely immersed into reagent or penetrant remover in order to prevent generating of bubble by mixing of air, in carrying out regurgitation, or either of 4.
6. Control method of magnetic-substance particle by distributive-pouring machine indicated by claim 1 characterized by enabling setup of rate of liquid attracted from container in case of stirring and washing, or either of 5.
7. Control method of magnetic-substance particle by distributive-pouring machine indicated by claim 1 to which liquid is characterized by directing suction of air extremely in the case of minute amount in case of stirring and washing, or either of 4.
8. The pipet section is the control method of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 1 which is the pipet chip with which 1 or two or more nozzles which were prepared in the distributive-pouring unit were equipped respectively free [attachment and detachment], and is characterized by controlling to perform the method of a publication to a claim 1 or either of 7 simultaneously when two or more nozzles are equipped with each pipet chip, or either of 7.
9. Analysis of the Aforementioned Content of Directions of Process (S101) Judge the number of samples, and the sample number of partitions from the inputted content, and the aforementioned matter conditions, a reaction condition, or an operating condition is judged. Or the control method of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 1 characterized by carrying out by judging directions of pretreatment or inside processing in which the preliminary treatment which pours initial complements, such as a required reagent, distributively in a predetermined container is performed in the intervals of [before processing execution and under processing], or either of 8.
10. It is the **** method of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 1 characterized by to make the decision of the aforementioned processing pattern of process (S102) to the specified item based on the processing time or the cartridge container position of each process included in each item between the number of reactions contained in each item, the specified number of samples, the sample number of partitions, and the total time of each item, or either of 9.
11. Sum Total Working Hour T except Incubation from Start of Processing Which Consists of 1 or the Two or More Numbers of Reactions when the Number of Samples or Sample Number of Partitions is Plurality to

End The time t of an incubation is inputted, measured or registered, and the minimum incubation time tmin is carried out to more than the aforementioned sum total working hour T. or incubation time t The control method of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 1 characterized by inputting directions information or determining a processing pattern so that it may become the integral multiple (n) of minimum incubation time tmin, or either of 10.

12. When the Number of Samples or Sample Number of Partitions is Plurality Each working hour divided by 1 or two or more incubations among the sum total working hours from the start of the processing which consists of 1 or the two or more numbers of reactions to an end is inputted. In measuring or registering and receiving directions of processing during the above The control method of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 11 characterized by inputting directions information or determining a processing pattern so that the processing time for processing may be set up a little shorter than each aforementioned working hour, while needing in each reaction process.

13. Directions of the Aforementioned Processing Execution of Process (S103) The directions which carry out the regurgitation to the container which inhaled the sample and was specified with required stirring, The directions to which the magnetic-substance particle combined with the quality of the specified substance which the magnet formed in the aforementioned distributive-pouring machine was made to approach a pipet chip, and has been suspended in the aforementioned liquid is made to stick inside a pipet, The control method of the magnetic-substance particle by the distributive-pouring machine indicated [bird clapper / suction and the directions which carry out the regurgitation to] by the claim 1 by which it is characterized, or either of 12 in directions of stirring by performing high-speed suction and regurgitation to a pipet chip, and the liquid in a container.

14. Pipet Section Which Has Isolation-Region Section by Which Magnetic Field Operation is Done in Liquid Path Which Connects Point, Reservoir, the Point Concerned, and Reservoir, and the Liquid Path Concerned, The distributive-pouring unit which negative pressure or the liquid which pressurized and suspended the magnetic substance in the aforementioned pipet circles is attracted [unit], or makes the pipet circles concerned breathe out, It has the control means which perform control to the source of a magnetic field, the source driving gear of a magnetic field which drives the source of a magnetic field in order to do or remove a magnetic field operation from the lateral surface of a liquid path to the aforementioned isolation-region section, and the aforementioned distributive-pouring unit and the aforementioned source driving gear of a magnetic field. The kind concerning [the control means concerned] matter, such as quality of the specified substance, such as a sample, and a magnetic-substance particle Reaction conditions, such as time of matter conditions, such as quantity or a hold place, the number of reactions, and an incubation, or temperature, Or a directions information input means to input the directions information containing operating conditions, such as existence of adsorption by the existence, the position, the time, the sequence, the number of times, the speed, or the source of a magnetic field of the suction and the regurgitation by the distributive-pouring machine, (200), A content analysis means of directions to analyze the content of directions required for processing execution based on the aforementioned directions information that it was inputted (201), A processing pattern determination means to determine the processing pattern with which a distributive-pouring machine should follow based on the analyzed content of directions (202), The control unit of the magnetic-substance particle by the distributive-pouring machine characterized by having a processing pattern execution directions means (203) to direct processing execution based on the determined processing pattern concerned, to the aforementioned distributive-pouring machine.

15. The Aforementioned Control Unit Has Container Concrete Supply System Which Transports Container to the Target Position Further, and the Aforementioned Control Means are what Performs Control to Distributive-Pouring Unit, the Aforementioned Source Driving Gear of Magnetic Field, and Container Concrete Supply System. The aforementioned processing pattern determination means determines the processing pattern with which a distributive-pouring machine or a container concrete supply system should follow. the aforementioned processing pattern execution directions means The control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by directing processing execution to the aforementioned distributive-pouring machine or a container concrete

supply system based on the determined processing pattern concerned.
16. The aforementioned control unit is a control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by having an analysis means to analyze the processing result obtained as a result of execution directions, or 15.
17. It is the pipet chip with which a nozzle is equipped by attaching the aforementioned pipet section free [attachment and detachment of the nozzle prepared in opening of the aforementioned reservoir at the aforementioned distributive-pouring unit]. The aforementioned control means are the control units of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by performing control of attachment and detachment with the aforementioned nozzle and the aforementioned pipet chip, or either of 16.
18. ** which prepares beforehand a reagent, a penetrant remover, etc. required for magnetic-substance particle suspension, the fixed quantity of the quality of the specified substance, quality, extraction, etc. requirements every along with the move locus of the pipet section, make move the pipet section along with this locus, and suction - breathes out each liquid -- the control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by constituting like, or either of 17
19. It is the control unit of the magnetic-substance particle by the distributive-pouring machine which prepares beforehand a reagent, a penetrant remover, etc. required for magnetic-substance particle suspension, the fixed quantity of the quality of the specified substance, quality, extraction, etc. for the liquid hold section of a requirements [every] container, and was indicated by the claim 14 characterized by controlling the aforementioned control means to move this container itself or each liquid hold section of a container to the rise-and-fall position of the pipet section, or either of 18.
20. The aforementioned control means are the control units of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by controlling so that two or more nozzles in which the pipet chip was formed by the distributive-pouring unit are equipped respectively free [attachment and detachment] and each [these] pipet chip performs predetermined separation, stirring, and washing simultaneously, or either of 19.
21. The aforementioned control means are the control units of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by to control for this point to go up to the height which cannot touch a container, to locate the bottom and the aforementioned point of the aforementioned container in point-blank range, and to perform suction or the regurgitation when the point of the pipet section was equivalent to the bottom of a container and the lowest edge has been recognized as submergence mode, or either of 20.
22. The control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by attaching the liquid level sensor which is equipped with the distributive-pouring unit which has two or more nozzles with which it can equip free [attachment and detachment] for the pipet chip of two or more, and senses an oil level only to one of the aforementioned nozzles, or either of 21.
23. The aforementioned source driving gear of a magnetic field is a control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by being constituted possible [movement in the direction which carries out proximity alienation of a magnet and the pinching object of each other], or either of 22.
24. The control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by arranging thermostats, such as a heat insulation warehouse, in the container installation-or bottle side of a reagent, or either of 23.
25. The control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by having the test section which has cover structure and arranging the measuring device of radiation, such as optics, an electromagnetic wave, and an electron ray, in this test section, or either of 24.
26. The control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 25 characterized by arranging the distributive-pouring nozzle which pours distributively reagents, such as a trigger reagent which is needed for the aforementioned test section at the time of measurement.

27. The control unit of the magnetic-substance particle by the distributive-pouring machine indicated about the predetermined sample by the claim 14 characterized by being what has the storage section which keeps the aforementioned pipet chip used in each process, such as separation, a reaction, stirring, and washing, possible [re-wearing] for every sample, and with which it can be re-equipped, or either of 26.
28. The control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by using what covered opening of the container which poured the reagent distributively beforehand by the thin film, or either of 27.
29. The control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by being what controlled so that original carries out processing execution after preparing so that a reagent may be poured distributively based on the information set up beforehand about an initial complement or a kind of reagent etc., or either of 28.
30. The aforementioned processing pattern determination means is the control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by to determine a processing pattern to the specified item based on the processing time or a cartridge container position of each process included in each item between the number of reactions contained in each item, the specified number of samples, the sample number of partitions, and the total time of each item, or either of 29.
31. The aforementioned processing pattern determination means is the control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by to have the content analysis section of directions which analyzes the content inputted from the automatic input section, and the processing pattern determination section which determines the processing pattern with which a distributive-pouring machine or a container concrete supply system should follow based on the analyzed content of directions, or either of 30.
32. The Number of Samples and Sample Number-of-Partitions Judging Section Which Judges the Number of Samples, and Sample Number of Partitions from Content as which the Aforementioned Content Analysis Section of Directions was Inputted, The content of processing and the number judging section of reactions which judges the aforementioned matter conditions, a reaction condition, or an operating condition, Were directed from the aforementioned automatic input section. initial complements, such as a required reagent, are poured distributively in a predetermined container -- semi- -- the control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 30 characterized by having pretreatment and the inside processing directions judging section which judges directions of pretreatment or inside processing in which what processing is performed in the intervals of [before processing execution and under processing]
33. The Aforementioned Processing Pattern Execution Directions Means A means to inhale a sample and to perform directions of the regurgitation accompanied by stirring required for the specified container to a distributive-pouring machine, A means to perform the directions to which the magnetic-substance particle combined with the quality of the specified substance which the magnet formed in the aforementioned distributive-pouring machine was made to approach a pipet chip, and has been suspended in the aforementioned liquid is made to stick inside a pipet, The control unit of the magnetic-substance particle by the distributive-pouring machine indicated by a means to direct stirring by performing high-speed suction and regurgitation to a pipet chip, and the claim 30 characterized by having suction and the means which carries out the regurgitation for the liquid in a container.
34. When the Number of Samples or Sample Number of Partitions is Plurality, the Aforementioned Processing Pattern Determination Means The sum total working hour T except the incubation from the start of the processing which consists of 1 or the two or more numbers of reactions to an end The time t of an incubation is inputted, measured or registered, and the minimum incubation time tmin is carried out to more than the aforementioned sum total working hour T. or incubation time t The control unit of the magnetic-substance particle by the distributive-pouring machine indicated by the claim 14 characterized by determining a processing pattern so that it may become the integral multiple (n) of minimum incubation time tmin, or either of 33.
35. When the Number of Samples or Sample Number of Partitions is Plurality, the Aforementioned

Processing Pattern Determination Means In inputting, measuring or registering each working hour divided by 1 or two or more incubations among the sum total working hours from the start of processing to an end and receiving directions of processing during the above The control unit of the magnetic-substance particle by the distributive-pouring machine indicated by either of the claims 34 characterized by determining that a processing pattern will set up the processing time for processing a little shorter than each aforementioned working hour while needing in each reaction process.

36. Pipet Chip Which Has Isolation-Region Section by Which Magnetic Field Operation is Done in Thinner Liquid Path to which Point, Thicker Reservoir, the Tapering Point Concerned, and Tapering Reservoir are Connected, and Liquid Path, It attaches in opening of the aforementioned reservoir free [attachment and detachment of a nozzle]. the inside of the aforementioned pipet chip Negative pressure or the distributive-pouring unit which pressurizes, and attracts liquid for the aforementioned pipet chip, or is made to breathe out, the lateral surface of the aforementioned liquid path -- receiving -- contiguity -- the source of a magnetic field prepared free [alienation], and this source of a magnetic field to the aforementioned liquid path with the magnet driving gear which carries out contiguity alienation operation of the aforementioned distributive-pouring unit, and contiguity of the aforementioned source of a magnetic field to the aforementioned pipet chip of the attachment and detachment and the aforementioned magnet driving gear of movement, and the aforementioned nozzle and the aforementioned pipet chip -- the control unit of the magnetic-substance particle by the distributive-pouring machine which has the control unit which controls alienation

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[Translation done.]